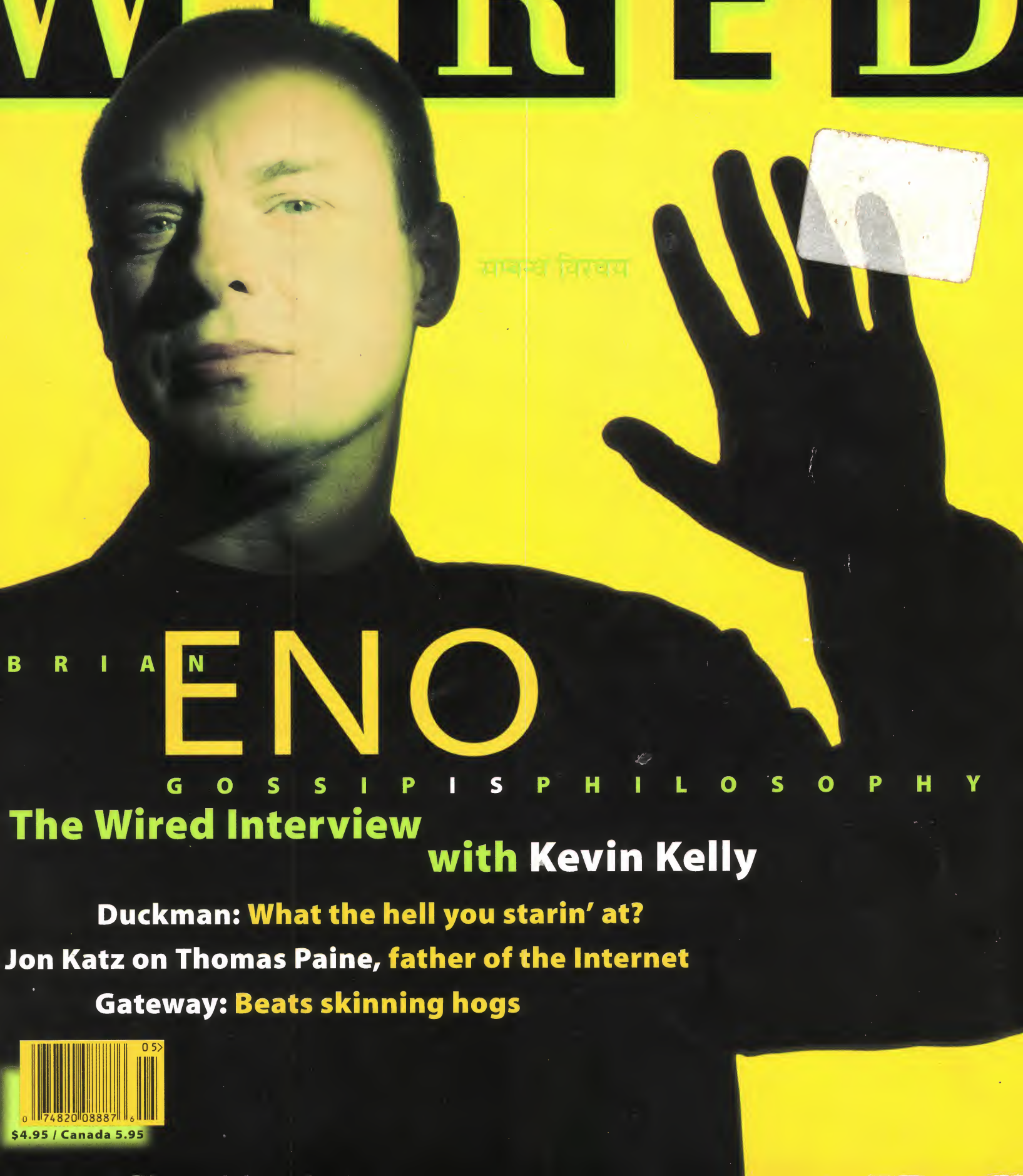
WIRED

May 1995



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Jon Katz on Thomas Paine, father of the Internet

Gateway: Beats skinning hogs

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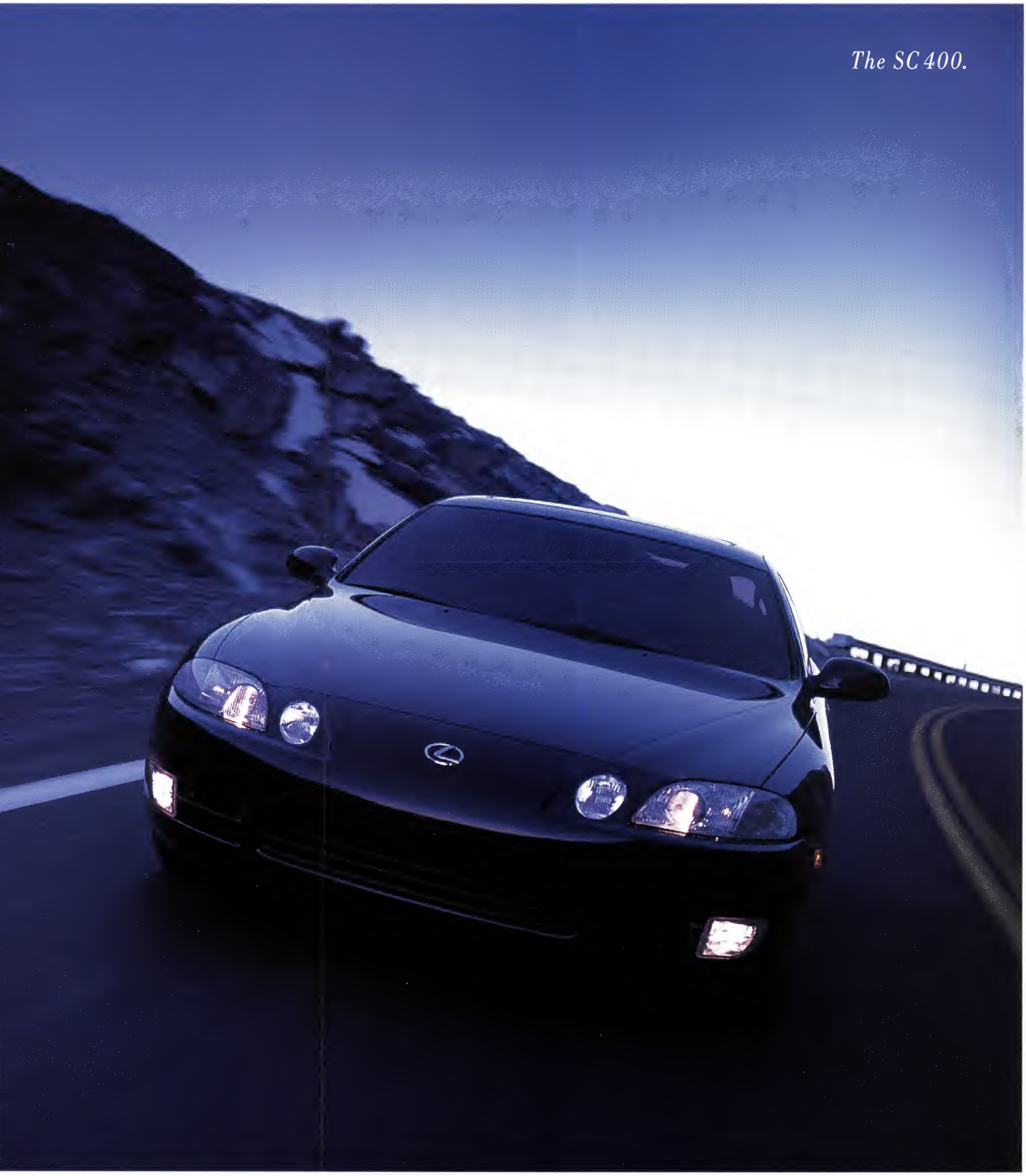

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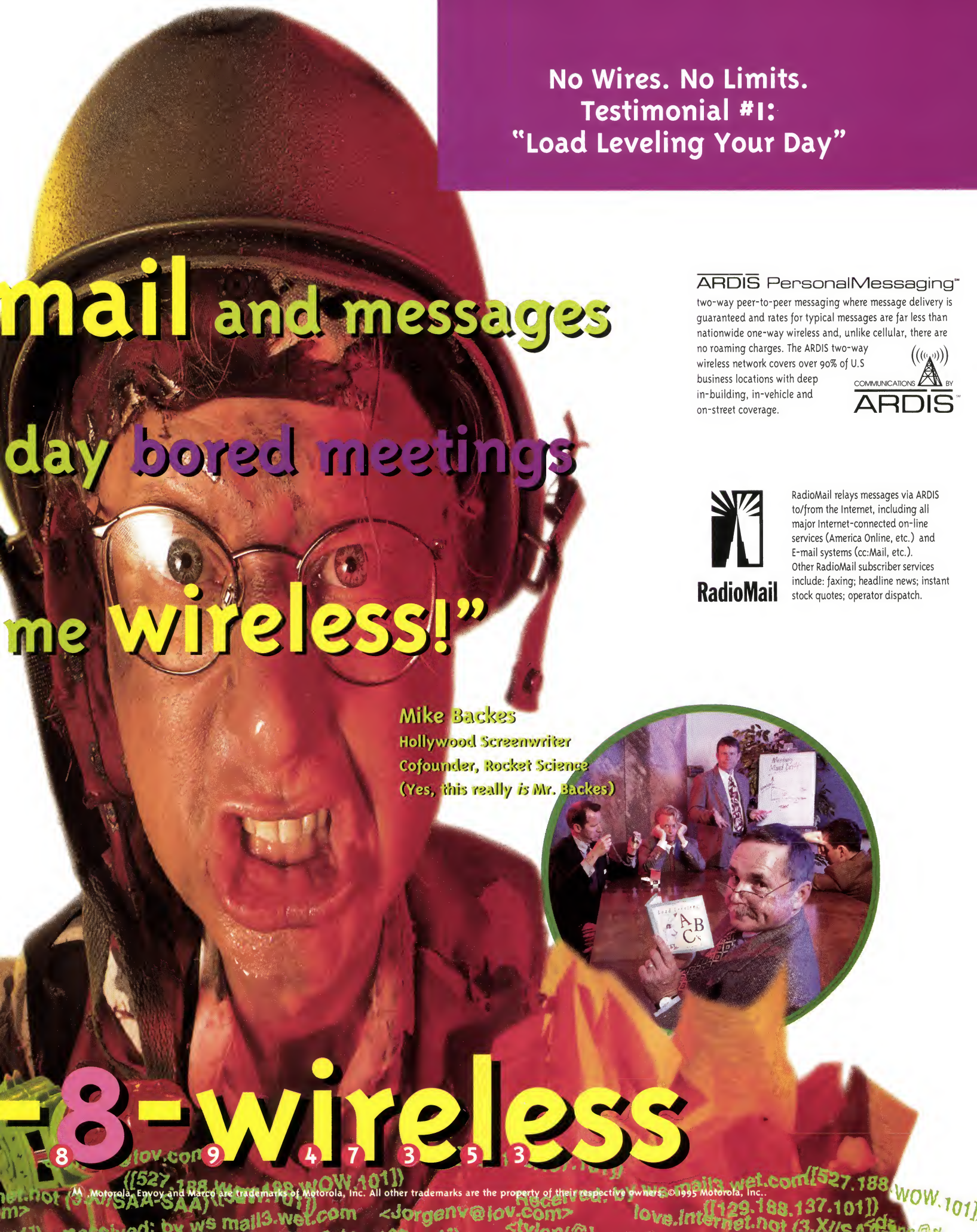
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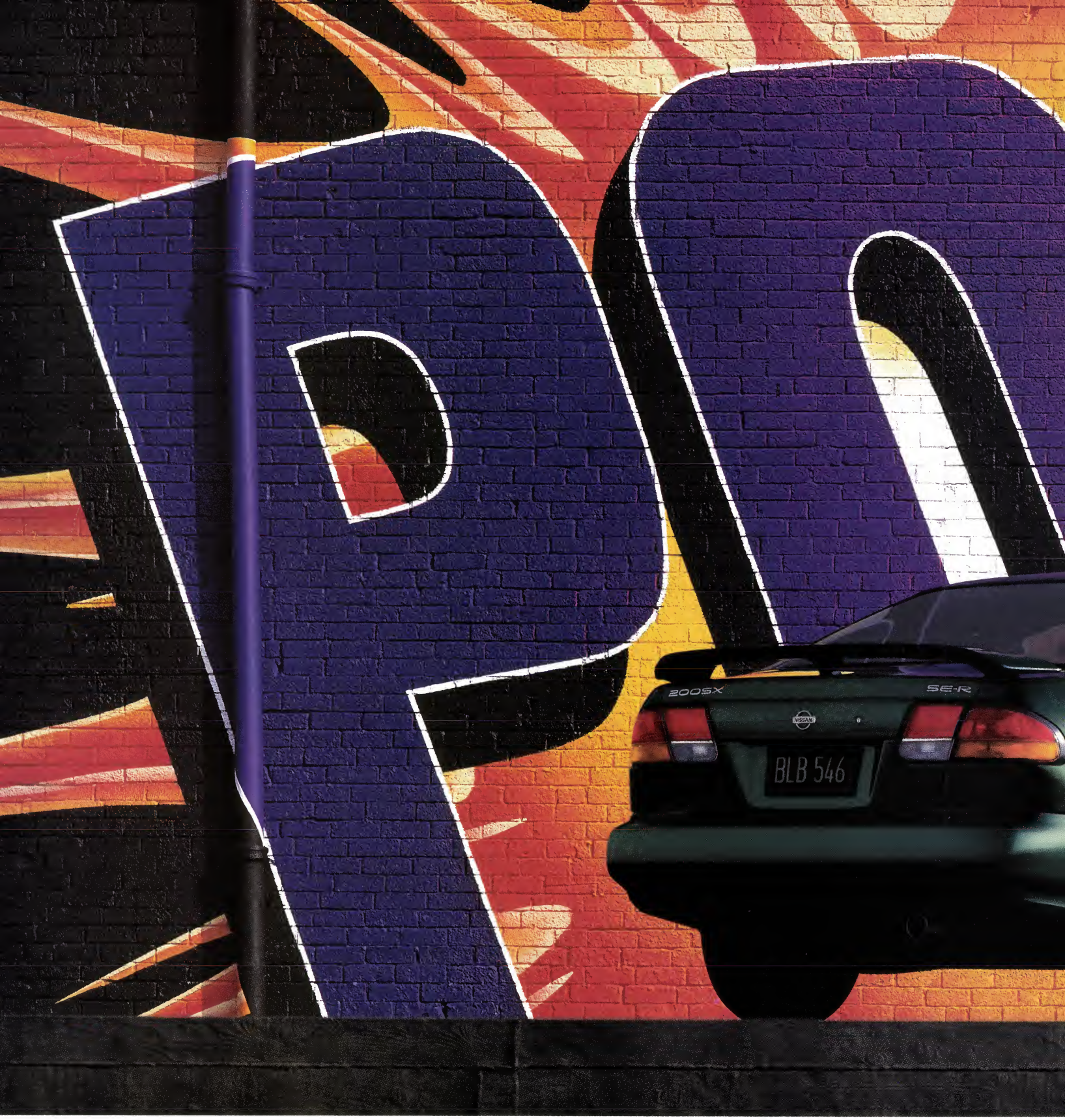

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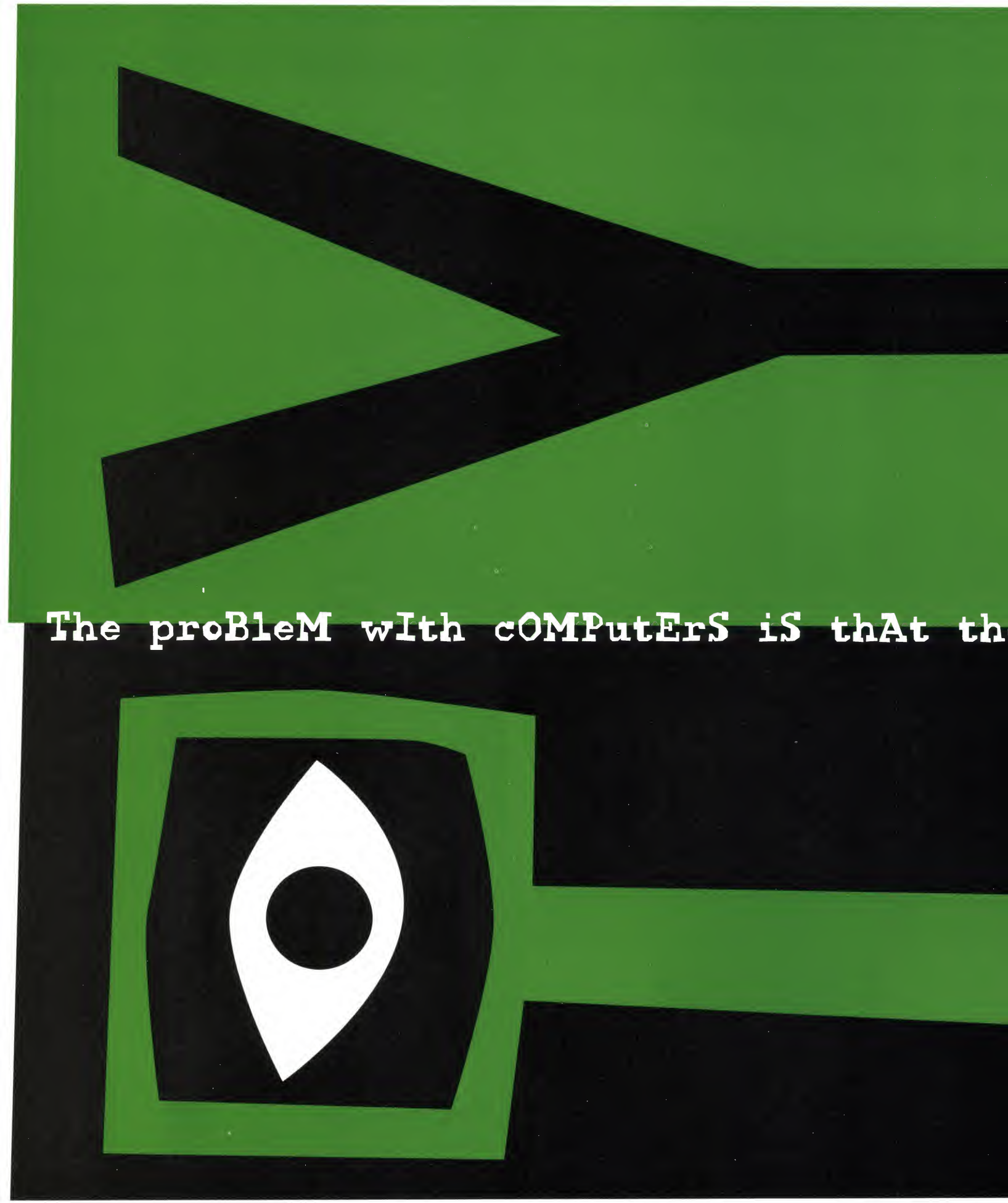
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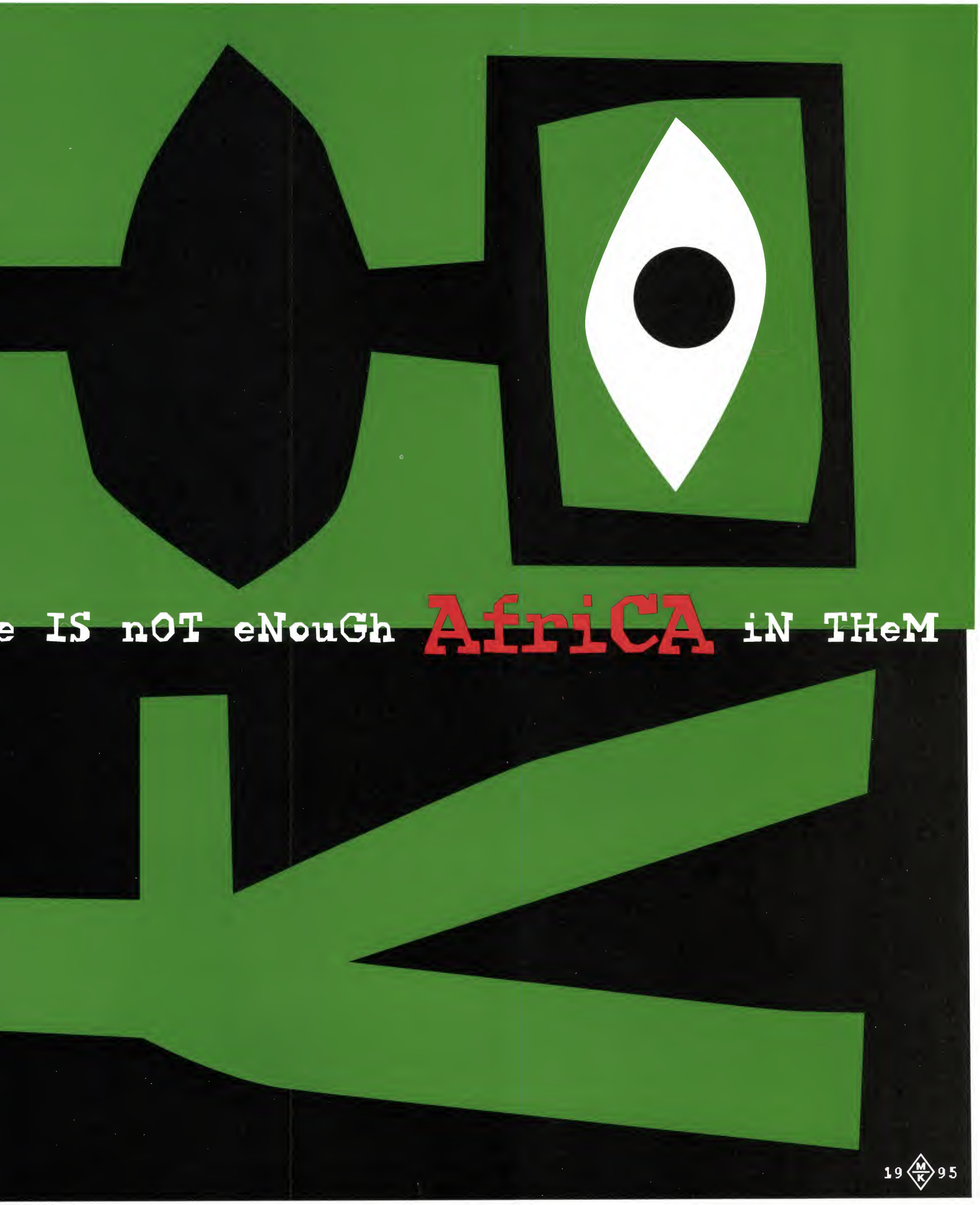
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pAge 146

WIRED
3.05 May 1995

28 RaNts & RaVES
Reader feedback

43 EleCTric WoRd
Bulletins from the front line of the digital revolution

53 SCaNS
People, companies, and ideas that matter

65 feTiSH
Techno-lust

74 reALity CHECk
The future of solar energy

76 rAW dATa
Stats 'R' Us

78 GEek pagE
Wavelet image compression

80 fOllow thE mONEy
Selling the Net short

82 UpdAtA
Ziff, PSI, Paul Allen

84 cyBER RighTS now
Can pyromaniacs fight fires? By Peter Cassidy

ELectRoSPhEre

88 tHE soFtwARe PolIce By Bronwyn Fryer

98 ThE neXt BeSt ThiNg to BeiNG TheRe By Robert Rossney

108 DigITal PHoTOproS and PhOTo(sHop) ReALism
By Jacques Leslie

114 ThE New RUSsiAnS By Masha Gessen

122 GooD Cop, Bad HacKer By Bruce Sterling

130 CulTUrE Wars By John Andrews

IdéEs foRTes

141 Net ACcesS for nEXt to NoTHing By Sandy Sandfort and Duncan Frissell

141 AddResSing the FuTure Of The Net By Steve G. Steinberg

181 StREEt crEd

197 NeT SuRF

202 DeDuctIble JuNkeTs

224 NichOLaS NeGrOPonte

1995

N t e X t

158

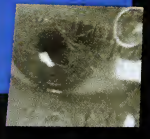
AcID arT
The medium is definitely the message. Far out.
By Jennifer Holmes

160

beAts SKinnIng hoGs
PC manufacturer Gateway 2000 grew into a multimillion-dollar business in just seven years. Charles Platt went to South Dakota to see how.

SUper SeARchEr
Cybrarian Reva Basch is the ultimate intelligent agent.
By John Whalen

152

178 

dIGital RefUsnIk
Sven Birkerts believes that technology is leeching the spiritual out of human experience.
By Harvey Blume

GoSsip iS pHIlosOphy
Kevin Kelly talks to the prototypical Renaissance 2.0 artist about why music has ceased to be the center of our cultural life, why art doesn't make any difference anymore, and why Brian Eno offers no resistance to seduction.

174

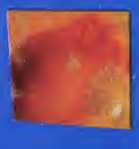
DéjÀ Vu all OVer agAIn
Many-to-many communication. Citizen control of a remote political process. A new culture and a new economy. Sound familiar? Such was the hype for a technological revolution 75 years ago – radio.
By Todd Lappin

146

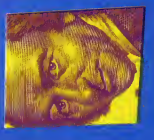
168

WHat The hELL yOu sTaRIn' At?
It's edgy, outrageous, smart – and as "underground" as TV gets. Now in its second season, Duckman redefines animation even more than The Simpsons did.
By Rogier van Bakel

JeWEl bOXer
Vaughan Oliver transforms album art.
By Mandy Erickson

172 

tHe Age Of PaiNe
Thomas Paine was one of the first journalists to use media as a weapon against the entrenched power structure. He should be resurrected as the moral father of the Internet. Jon Katz explains why.



154

Cover: Brian Eno photographed by Steve Double, February 1995, London
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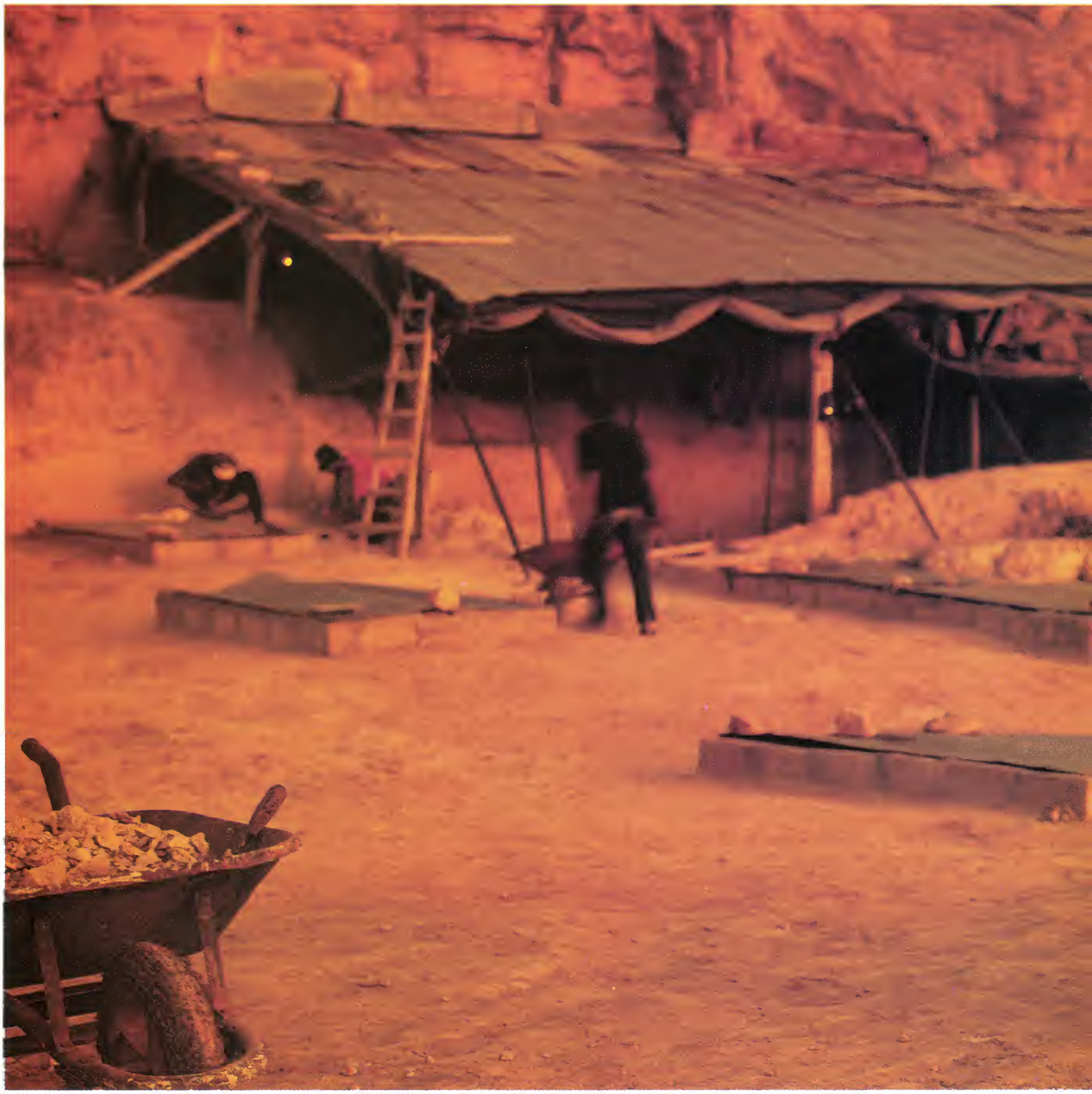

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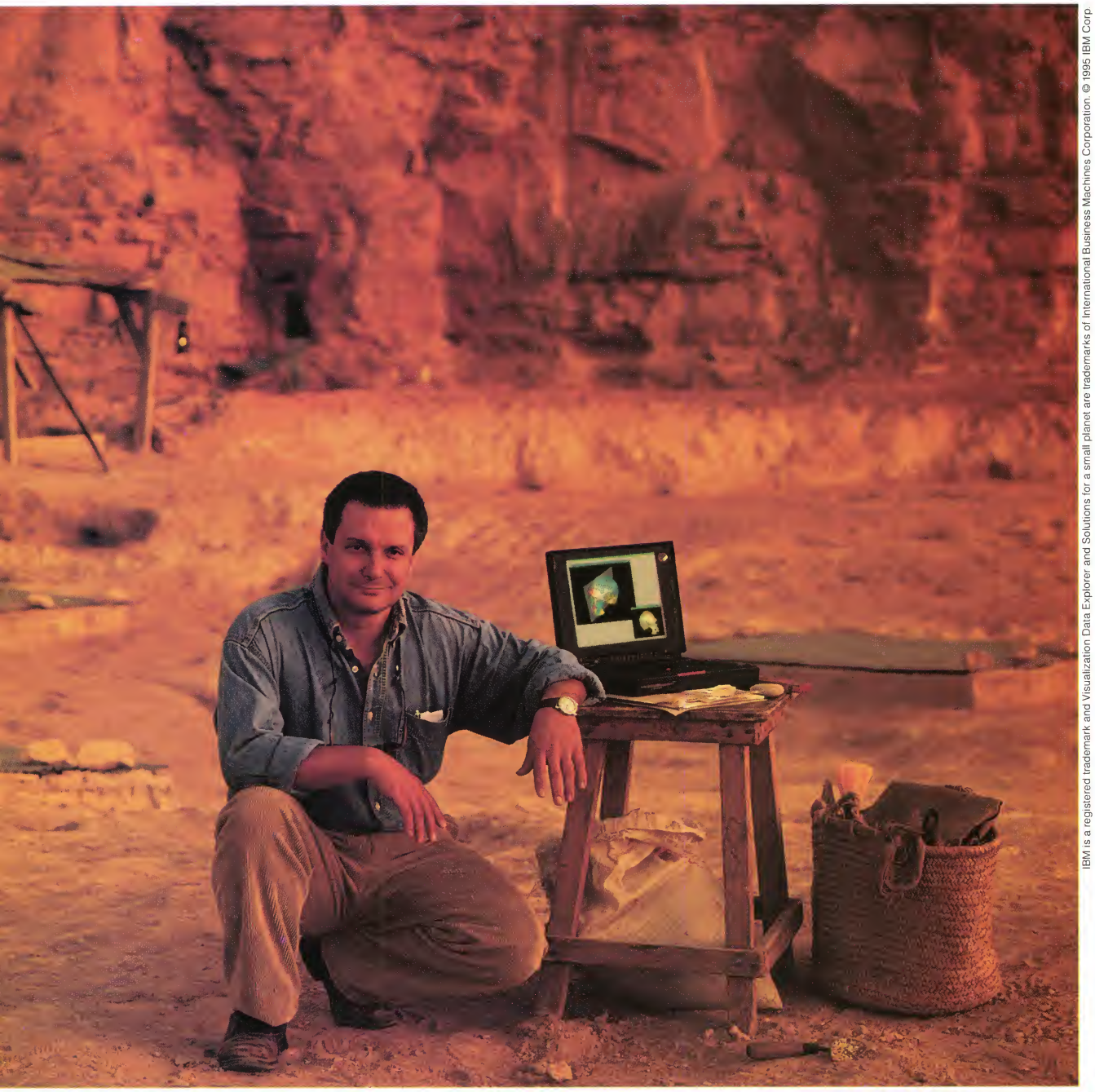

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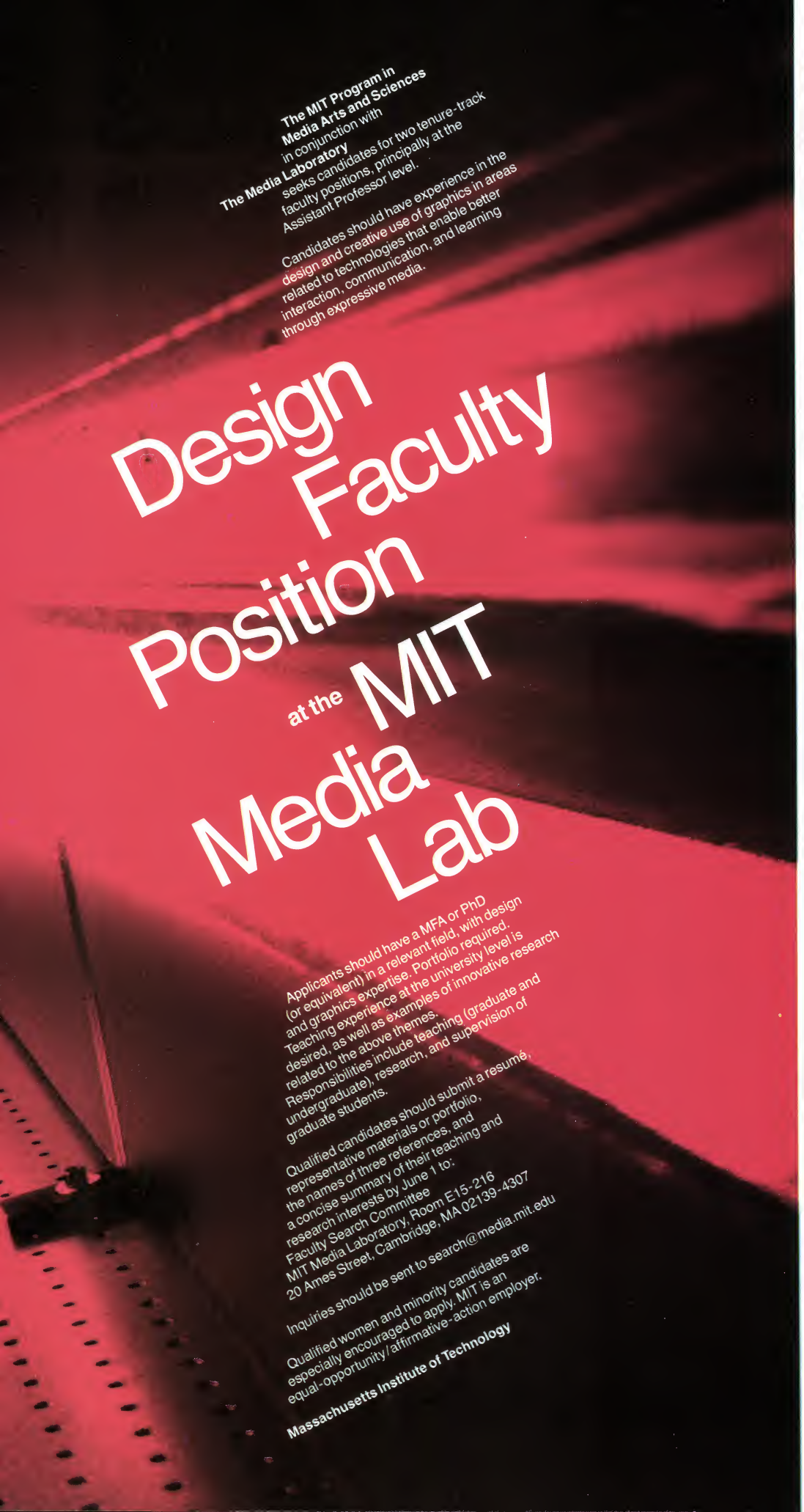

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Copy Right or Wrong?

Lance Rose's piece "The Emperor's Clothes Still Fit Just Fine" (*Wired* 3.02, page 103) was laudable in its attempt to argue that copyright has a place on the Net. Yet we want to take issue with his depiction of the National Writers Union.

The union is bullish on intellectual property, but we are not like trade organizations such as the Software Publishers Association, although Rose lumped the two together. Our posture is not, as Rose contends, one of "fangs bared at all times, hissing, 'Don't copy that floppy.'"

We do hiss, but not at the end user who casually shares a copy of a full-text article downloaded from one of the commercial services. Instead, we are biting into those service providers that have conspired with print publishers to steal the electronic rights to freelance articles written by our members for various magazines and newspapers.

The likes of Dialog, Nexis, and Information Access Company have grown fat on the profits of full-text delivery. Our members who wrote the stories in the first place – and still hold the copyright on them – haven't seen a dime. That is the kind of electronic piracy the NWU deplores.

Philip Mattera, Vicki Richman, Bruce Hartford
National Writers Union

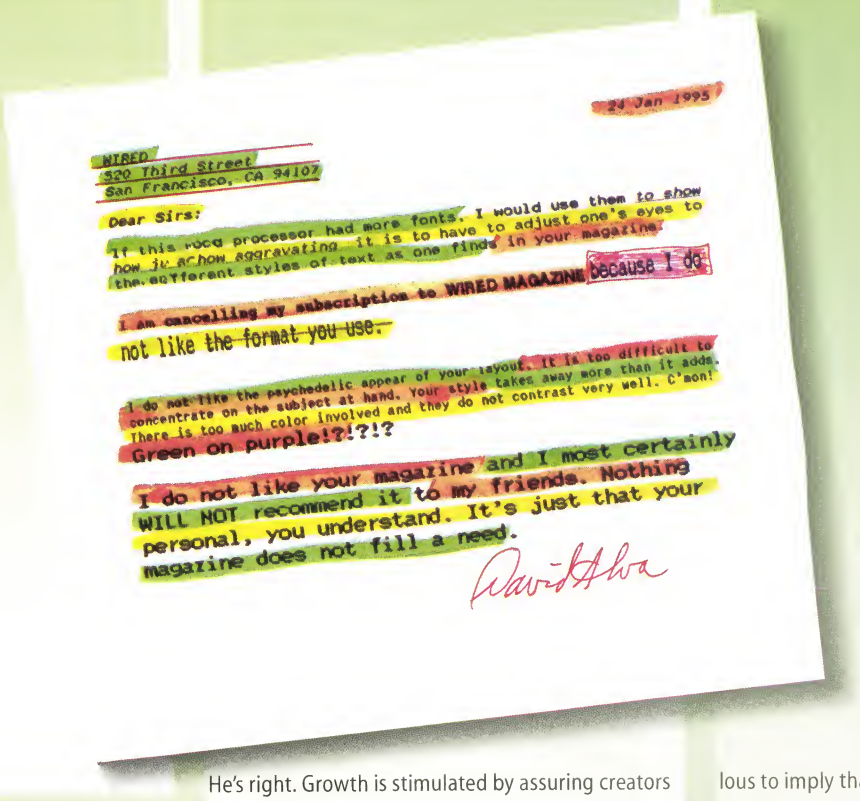
A Sampling of the Facts

Nearly all the assumptions and statements regarding copyright law made by Negativland, its lawyers, and Colin Berry are completely, absolutely, and totally wrong ("The Letter U and the Numeral 2," *Wired* 3.01, page 58).

"Art," they are fond of reminding us, "is not a business." No, but exchanging copies of that art for money *is* a business. You can call it art, but once it's mass-produced and sold, it's commerce.

"The idea behind copyright law is that the people who create should receive adequate compensation for what they've done." Wrong. The idea behind copyright law is that the creator establishes ownership of what he or she has created.

"Intellectual property is not the same thing as personal or real property." No, it's not the same thing, but it is just as protectable by law. "And," attorney Jeff Selman continues, "the whole purpose behind intellectual-property rights is to stimulate growth."



He's right. Growth is stimulated by assuring creators ironclad protection of their intellectual property.

The irony of Negativland's position is that if they knew what they were creating, and if they had been hip enough to copyright law, they could have claimed that what they were creating was parody – and been legally protected.

Gerard Mooney
Dobbs Ferry, New York

U2 never sued Negativland; Island Records did. The interview with The Edge mentioned in the article can be found on the Web at *http://sunsite.unc.edu:80 /id/negativland* as can the song that caused all the trouble (in .au format), more information about copyright(s) and the law, and band information.

Bill Hunter
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Freedom from Litigation

According to Mike Godwin, "online counsel" for the Electronic Frontier Foundation, universities have an obligation to provide students with access to *all* the resources of the Internet, including alt.sex .bizarre and other sex-related topic areas ("alt.sex.academic .freedom," *Wired* 3.02, page 72). Furthermore, he claims students have a right to access such materials via the university's computing and network infrastructure.

Hey, I'm all for rights, freedoms, and letting college kids explore the realm of the birds and bees (although, unless something's changed since I was there, they already knew about most of it when they enrolled). But since when is this some kind of cyber-rights battle?

A university, often with the assistance of state, federal, and alumni funding, creates a computing and network infrastructure to support the *academic* needs of the staff and students. It is ridiculous to imply that a university does not have the "right" to restrict the usage of its network to those activities it believes are directly related to the educational or administrative needs of the students and staff. CMU was considering restricting students' access via the university's computer systems; they never threatened the students' right to go get a Netcom account and get all the alt.sex.crap they ever wanted – all on their own time and money. I suppose the EFF would say this is about "censorship." C'mon. This is about a university trying to cover its ass in an age of lawsuits and litigation – it has absolutely nothing to do with censorship. Lawyers create this

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type of reaction; Godwin shouldn't be surprised by it.

Your publication of such a one-sided, misguided argument only illustrated that both *Wired* and the EFF are still a bit naïve about the real-world issues that arise in an internetworked society.

Deverix A. Horn
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The Real Master of Deception?

When I first read your piece "Gang War in Cyberspace" (*Wired* 2.12, page 146), I nearly choked on my own stomach bile. The tone of this piece was so far removed from reality I found myself questioning what color the sky must be in *Wired*'s universe. Not that I've come to expect any better from *Wired*. Your magazine, which had the potential to *do* something, has become a parody – a politically correct art-school project that consistently falls short of telling the whole story, or making a solid point.

I find it interesting that so much emphasis can be placed on the issue of supposed racial slurs. (It's also interesting to me that people keep overlooking the fact that one of the first members of our own little Legion of Doom was black – the late Paul Muad'dib.)

The whole "racial issue" was a non-issue.

Despite Slatalla and Quittner's assertion that I so enjoyed "doing conference bridges," I abhorred the things. The bridge referred to in the story was popularized by the callers of the 5A BBS in Houston, Texas. Many people from Texas did call the BBS, and subsequently used the bridge, but so did people from Florida, Arizona, Michigan, New York, and Louisiana. And, as is typical in the underground, word of a new place to hang out caused it to swell rapidly.

To imply that such things were strictly New York-versus-Texas issues is ludicrous.

Those prank calls also had about as much to do with the formation of Comsec as bubble gum had to do with the discovery of nuclear fission. At the risk of sounding glib, we couldn't have cared less about the hackers at Comsec. Hackers account for so little in the picture of computer crime their existence is more an annoyance than something to fear. However, when those same hackers crossed the line and began tapping our phone lines, we were more than glad to go after them.

This is not to say that we were the only people from the computer underground who went to various law enforcement agencies with information about MOD and its antics. In fact, the number of hackers who did was staggering, especially when you consider the anarchy of the underground. None of these other complaints are ever mentioned, making those of us at Comsec seem the "narcs." MOD managed to alienate the vast majority of the computer underground, and people reacted.

All in all, both in this piece, and in the book, *Masters of Deception: The Gang That Ruled Cyberspace*, Slatalla and Quittner managed to paint a far too apologetic picture of a group of people who cared very little about the networks in which they played, and the people who lived there. In my 15 years skulking the Net, I have seldom, if ever, seen people in the community treat network systems or each other with anything but the greatest care and respect. MOD was one of the first true examples of a groupthink exercise in hacker sociopathy. Selling long-distance codes and credit-card numbers, destroying systems, and harassing innocent people is not acceptable behavior in any group, even the computer underground.

There have always been ego flares and group rivalries in the underground; there always will be. The Legion of Doom was founded because of a spat between its founder (Lex Luthor) and members of a group called The Knights of Shadow. These rivalries keep things interesting and the community moving forward as hackers butt heads in an attempt to find the newest bit of information in healthy one-upmanships. MOD was different. It took things too far. And not just against two people in Texas.

I certainly don't condemn everyone in the group. I don't even know a number of them (electronically or otherwise). I honestly believe that Mark Abene (Phiber) and Paul Stira (Scorpion) got royally screwed while the group's two biggest criminals, Julio Fernandez (Outlaw) and Allen Wilson (Wing), rolled over on everyone else and walked away free and clear.

Imagine if I tried to explain that poor Jeff Dahmer was provoked to murder and cannibalism by the mocking of adolescent boys who teased and called him a faggot. How would you feel if I tried to convince you that we should look upon him with pity and think of him as a misunderstood political prisoner? You would probably feel the way I do about Slatalla and Quittner's story.

They did get a few things right. I do have a big cat named Spud, I do work at a computer company, and I do sell fantastic T-shirts. Buy one.

Chris Goggans
aka Erik Bloodaxe
phrack@well.com

One set of facts can be interpreted in many different ways. This is especially true when the interpreter is a participant in controversial historical events. We have several hours of tape-recorded interviews with Chris Goggans: his recollections, of course, are inevitably colored by his personal perceptions. Other participants saw the same events unfold through different eyes. Our job, as journalists and the authors of Masters of Deception: The Gang That Ruled Cyberspace, *was to sift through the vastly different accounts of what happened, and attempt to arrive at the truth. We believe we did that. Mr. Goggans is welcome to write his own book. – Michelle Slatalla and Josh Quittner*

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Align and Monopolize

Ray Smith's vision of interactivity ("Align and Conquer," *Wired* 3.02, page 110) is about as exciting as watching the Home Shopping Network and phoning in an order. Smith continues to disregard the notion that the general population is as capable of providing content as Creative Artists Agency and Sony. One glance at the success of the Internet should be enough to demonstrate the demand for high-bandwidth *bidirectional* access, in which subscribers could as easily create an audience as be part of one.

Despite all his coax and fiber optics, the best Smith can do is to save Bell Atlantic customers a trip to the mall.

Steve Hollinger
Boston, Massachusetts

Your two recent covers and "articles" depicting Malone as Road Warrior and Smith as Conan shows that *Wired* isn't *Wired* anymore. More like *Lifestyles of the Rich and Unwired.*

Once you got popular enough to mingle with the rich, famous, and monopolistic, you ceased to criticize, and instead began to toady.

I have never seen two articles less critical, probing, or intellectually stimulating – it was like reading a TCI or Bell Atlantic press release.

We don't need two monopolies in each area (RBOCs and cable providers). We need new entrants to make the monopolies obsolete, just as Microsoft, Sun, et alia made mainframe competitors obsolete. Your article is an example of "mainframe" thinking, ignoring the impact that "distributed" technologies like spread spectrum will have.

Michael Sheridan
msvwrk@aol.com

If Viruses Are Good for You, Then Why Am I So Sick?

Very brave of *Wired* to give some publicity to Mark Ludwig and to publish fragments of his Genetic Mutation Engine source code! ("Viruses Are Good for You," *Wired* 3.02, page 110.)

However, I am in no way convinced that the "battery of cryptographically secured restrictions to ensure that its agents don't subvert control of the host machine, either by accident or by malicious design" have any chance of working.

One of the early boot-sector infector viruses, "Brain," was pretty harmless when it was infecting the 360-Kbyte 5.25-inch floppy disks that were the standard when "Brain" was written. Yet when it crossed over to 1.2-Mbyte, 5.25-inch floppies, and 720-Kbyte, 1.44-Mbyte, and 2.88-Mbyte 3.5-inch floppies (all commonplace by the time "Brain" was in the wild), the virus destroyed data, because what it assumed was the last sector of a 360-Kbyte disk was actually the middle of the data storage area of higher-capacity disks.

Even if General Magic agents work only with their interpreted language, how can they foresee future developments in computer systems? And if they take the approach that only certified hardware or software platforms are allowed to run Telescript software, then they will fail commercially.

If they hope to use agents to automatically update Telescript, or to provide enhancements and bug fixes, then the system will be just as vulnerable to virus attacks as today's computer systems.

Mark Dziecielewski
mark@otaku.demon.co.uk

Julian Dibbell's notion that a virus is somehow worth something because it is a product of "culture" is inane and leading. The author goes on to intimate that we should not fear viruses, since, after all, they are "the traces of our fellow earthlings' shaping hands and minds." Perhaps we should neither fear nor loathe nuclear weapons, or toxic waste, as these things, too, were created by "our fellow earthlings" with their "shaping hands and minds."

Hellraiser is used by Dibbell as proof that the viral underground is some kind of respectable enclave. Hellraiser calls viruses "the electronic form of graffiti." Dibbell supports this notion, and compares Hellraiser's virus writing to his early history as a New York City tagger – which would be a fine analogy, if, perhaps, subway cars ceased to function once they were tagged.

Dibbell goes on to call Hellraiser's mag a "feisty defender of the right to create and publish viruses." Excuse me, but there's not a thing listed in the Bill of Rights or any other law that guarantees one the "right" to force one's way into another's system. I refer Dibbell, instead, to laws concerning privacy and harassment, if he is interested at all in matters of individual rights.

Although Hellraiser has supposedly turned over a new leaf and admitted that writing viruses to deliberately mess with other people is a "bad thing," I fully understand why he continues to go by his online pseudonym, rather than his real name, when interfacing with the public.

Scott Alan Malcomson
horseman@indirect.com

Gods of the Obvious

The odd couple/gods of digital type design? What? Says who? ("The Year Mozart and Sid Vicious Shared an Office in New York," *Wired* 3.03, page 130.) As an art director and publication designer, it is my job to make sure the subscriber reads an article – to make it interesting and legible, and to draw readers in and keep them reading.

I am sick of these prima donna designers who think it is more important to make a statement with illegible type (anyone can do that!) than to create substantive layouts. What do I mean by substantive? The best typography goes unnoticed by the untrained eye, and the reader is left only with the effect of the piece as a whole.

Denise Mei
Art Director for *The Limbaugh Letter*
neave@aol.com

Check (beep!) Mate (whirrr...)

It's comforting to hear that the developers of Deep Blue have no illusions about what they're doing as artificial intelligence. Wake me up when someone's created a machine that raises its eyebrow when its opponent makes a mistake, stands up to shake hands after the game is over, then gloats at its victory during the press conference.

When, not if, the day comes that Deep Blue, or some other machine, does beat Kasparov, then all that would have been proven would be that humanity can create a machine that can beat Kasparov at chess.

Robby Villabona
robbyv@admu.edu.ph

Tandy's Dandy

I just read your ode to the Tandy 102 ("Tandy's Text-Typing Genius," *Wired* 3.02, page 145). I still use a 102, as well as a model 100 I acquired in 1984.

There is a "Model 100 Club" out there. It has its own BBS, reachable via modem at +1 (510) 939 1246. Its sys admin, Richard Hanson, can be reached via e-mail at *richard.hanson@pcld.com.*

The Club has a "for sale" section and software downloads. You can also buy hardware add-ons, memory expansions, and the like.

The only downside to the machine these days is that you cannot attach a higher-speed modem to the serial port, because the screen refresh rate is only about 450 baud.

Jay Moynihan
jaymoy@ix.netcom.com

No Such Thing as a Free Lunch

I've been reading your rag for a while now and have referred many people to it. "What a great magazine," they say, as they pat me on the back and pick up the lunch tab. Free lunch you might say? Not really. They usually swipe my copy of *Wired* on their way out.

Maybe I should rig up one of those chains like the ones they have attached to the pens at the bank.... That'd show 'em.

Christopher Janney
zootsuit@winternet.com

Start 'Em Young

I read with growing excitement Connie Guglielmo's story about daVinci Time and Space ("Child's Play," *Wired* 3.01, page 86), the children's interactive tele-

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vision station that Carol Peters and Jeff Apple are developing. What a great idea: a series of virtual "places" through which kids can navigate while directly interacting with various characters and environments, creating their own stories day after day.

My excitement soured, however, when I read that "...advertisers will create places or interactive advertising components that can be incorporated into places." Oh, lovely. Just look who's standing behind Socrates, Johnny! It's Super Skiddoo, with his all-digital, rocket-powered cyberskateboard! Hop on board, Johnny, take a ride! And be sure to tell your folks how much fun you had!

Ethical considerations are swept aside with the rationale that, Gee whiz, the kids won't be able to buy anything on the air. Apple makes the insidious statement that in terms of advertising, "Children will win because they're empowered to decide for themselves what they want to do and when."

I suppose daVinci, which calls itself an "educational" station is, indeed, planning to educate kids directly into the consumer culture. No wonder the station was "on the verge of signing major deals with several national advertisers." I see an army of lockstep, prepubescent, mutant direct-marketing specialists. Their parents will love daVinci for that.

Jim Hermanson
an424@freenet.hsc.colorado.edu

Everything Old Is New Again

The "new technology" described by Raph Levien ("Stochastic Screening," *Wired* 3.02, page 68) was used to create the first fully digital color map to be produced in New Zealand a decade ago. At that time, it was a breakthrough in high-quality controlled production and printing – not easily matched by conventional methods – and was referred to as random dot screening.

Don Carli may be the inventor of the cool name, but I think the technology predates him.

Robin Carseldine
robin@robinjmc.actrix.gen.nz

You are absolutely right. Stochastic screening has been around for a while. In fact, mezzotints and other methods of printing grayscale images predate the traditional halftone. On the digital side, Floyd-Steinberg error diffusion is 20 years old. What is new is that stochastic screening techniques have been refined to be practical for daily production. Of course, that had to wait until prepress changed from a photochemical process into an almost purely digital one. – Raph Levien

Pay Attention to the Parameters

In Reality Check, "The Future Of Food" (*Wired* 3.01, page 52) takes a narrow view of farming and fails to include what will be the only future of food production in the heavily populated modern world.

Methods of food cultivation such as hydroponics, food tablets, and super preservatives will use vast amounts of energy and water – scarce items in an overpopulated world. Genetically engineered plants will also pose huge problems. Lesser developed countries will not be able to afford the seeds, cloned species, and seedlings patented and manufactured by large, first-world-based corporations. These countries have the highest population growth, will need the most food in the future, and will be the least likely to afford it.

The specialists interviewed by *Wired* are nearsighted as well. The plants that sprung from the green revolution – ones on which "Future Foods" is based – were successful only because of large amounts of expensive, fossil-fuel-based fertilizers and energy-intensive farming; methods with a limited future.

The paraprimitive and sustainable methods of agriculture that include multicropping, organic fertilizers, decentralized small farms, integrated pest management, minimal till, and the use of native species will prove to be the future of food production, much to the dismay of giant corporations.

Wired needs to realize that "gee-whiz-bang" technology – though fascinating – plays second string to the limitations of our planet.

Daniel Beerman
eap408@aol.com

Gods of the Obvious

Wired is a university in itself, a textbook for not only the digital culture, but the analog one as well. I hope you continue the great work, with the writing, design, and editorial content.

Lou Maxon
maxmediadz@aol.com

Undo!

• We neglected to mention other creative contributors to Computer Curriculum Corporation's *Choosing Success* ("Multimedia Gets Real," *Wired* 3.02, page 51), contributors who include Don Bajema, Doug Mackbee, Mary O'Brien, Chris Thompson, Dan Ligon, and Francee Covington. • A missed detail: in Fetish ("Catch Some Air," *Wired* 3.02, page 60), we listed Burton's Air 5.0 snowboard as the "Air 50." Makes a decimal point of difference. • In the January, 1995 issue (*Wired* 3.01, page 74), we inadvertently misspelled artist Wes Studi's first name. Our apologies, Wes. Our typo-catching brains must have gone temporarily West.

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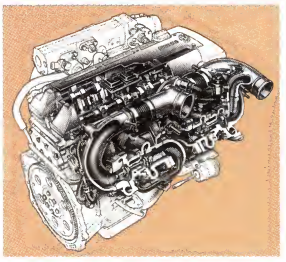

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Don't Ask, Don't Tell, Don't Even Look at This Poster

In its determination to sustain the myth that the men in the armed forces don't suck dick (and the women do), the US Navy recently attempted to delay the release of *Conduct Unbecoming*, a CD-ROM based on journalist Randy Shilts's book about gays and lesbians in the US military.

A Navy lawyer told ApolloMedia, which produced of the CD-ROM, that if it used a 1972 recruitment poster in *Conduct Unbecoming*, it would be "in big jeopardy."

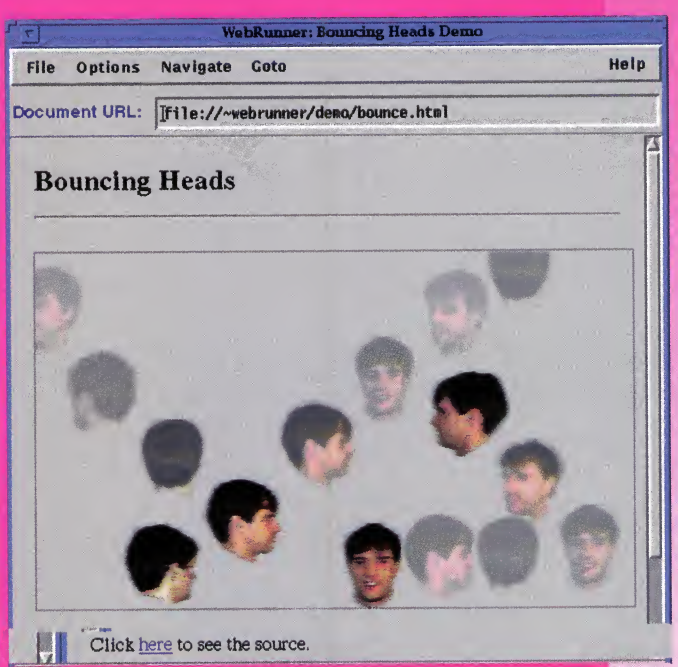
The Navy claimed that the US Naval Academy crest was a registered trademark. The poster features Ed Graves, an Annapolis graduate and the Navy's first black poster boy. The Navy stopped using the poster after learning that Graves is gay.

Refusing to bend, ApolloMedia informed the Navy of its intent to use the image anyway, and for a moment, it looked as if neither side would blink. But after mulling over the looming publicity nightmare (ApolloMedia called a press conference to announce the Navy's actions), the Navy withdrew its threats. ApolloMedia: +1 (415) 552 7655. – *Julie Petersen*

PHOTO: MARLA AUFMUTH

ELECTRIC WORD

A Better Way to Weave the Web



When Mosaic was released in early 1993, the growth of the World Wide Web exploded. Now, a technology in development at Sun Microsystems promises to kick in the turbocharger.

Sun's soon-to-be-released Web browser, code named WebRunner, removes the code for standard features such as http (hypertext transfer protocol, the communications language of the Web) and HTML (hypertext markup language, the display language of the Web) built into other browsers. Based on Sun's failed First Person operating system, WebRunner implements a "plug-in" architecture similar to Photoshop. Plug-ins can be downloaded on the fly as needed: to add a feature like animation to your site, just write a plug-in and stick it on your Web server.

To get to this point, Sun has written a C++ derivative language called Java. All code is written in Java, so there are no tricky cross-platform issues during plug-in development.

WebRunner has the potential to push Web feature development down to the front lines – the content creators. Kai Krause, are you listening? – *Anders Lund*

Home-Brew Stock Market

In February, Andrew Klein's tiny Spring Street Brewing Co. became the first company cleared by the Security and Exchange Commission to sell stock on the Internet. "The Net allows us to reach millions of people," says the 34-year-old former securities lawyer, who hopes to raise US$5 million through the sale of 2.7 million shares of common stock. "And it costs us only $125 per month for the hookup."

Klein may have ignited a trend among companies trying to avoid Wall Street's stiff underwriting fees. "He's bypassing the whole brokerage community," says Robert Natale, Standard & Poor's research director.

Spring Street is registered in only 15 states, so, depending on where you live, you may be able to buy the beer but not the stock. Spring Street Brewing Co.: +1 (212) 226 9110, e-mail *witbeer@interport.net*, on the Web: *http://www.interport.net/witbeer*. – *Ed Silverman*

≡III Bush Loses: Remember Don Wilson, President Bush's national archivist who, in the last hours of the administration, signed over almost total control of Bush's presidential records to Bush, rather than to the Office of the President? Well, that assignation has been declared null and void by a Federal judge, and the records, which include approximately 5,000 mainframe magnetic tapes and more than 140 hard drives, will remain the property of the National Archive. Wilson, you may remember, left the archive to take a job at the – ahem – Bush Presidential Library. There *is* some justice in the world. **≡III Borland Wins:** Borland could use some good news, and earlier this spring, a Federal appeals court gave the software maker a healthy serving. Lotus had sued Borland for US$100 million in damages, claiming Borland's Quattro Pro spreadsheet infringed the Lotus 1-2-3 copyright, particularly when it came to Quattro's "emulation mode," which employed a 1-2-3-like ►

Touch the Monkey

Looking more like a SoHo gallery objet d'art than a computer peripheral, the Monkey is a 23-inch-tall articulated mannequin that's used to produce animation quickly. Pose the Monkey like a giant Gumby and let the computer take a reading of the position of its 39 joints. For complicated sequences, such as hand-to-hand combat between a large cast of animated characters, up to 16 Monkeys can be used simultaneously through one serial port.

Although the Monkey costs US$12,500, that's peanuts when compared with renting time at a motion capture lab. Silicon Graphics heavyweights such as Wavefront, Softimage, and Alias support the Monkey, but, with the proper software driver, the articulated ape could help PC animators break into the big time. To learn more about the Monkey, as well as other cutting-edge products from Digital Image Design, swing on down to Digital's home page at *http://found.cs.nyu.edu/didi.html*. Digital Image Design: +1 (212) 343 2442, e-mail *monkey@didi.com*. – *David Reim*

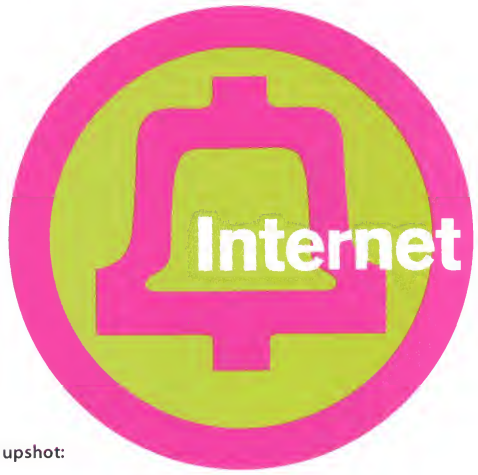
ANDREW KLEIN: JILL GREENBERG

I'm not a big reader of science fiction," Bruce Wagner admits. The writer and executive producer of *Wild Palms,* 1993's trippy TV movie, found inspiration for his latest show from the covers of sci-fi novels. That explains the suits of armor, dungeons, and reptilian prison wardens in *White Dwarf,* produced under the guidance of Francis Ford Coppola for Fox TV. The plot centers on an earthling doctor who goes to work on the planet Rusta, where one side is always in light, the other in darkness. The people living on the bright side are straight out of *Little House on the Prairie.* Their counterparts on the dark side relieve stress by terrorizing the good people. Wagner calls it "coming of age in the Milky Way." *– Mark Frauenfelder*

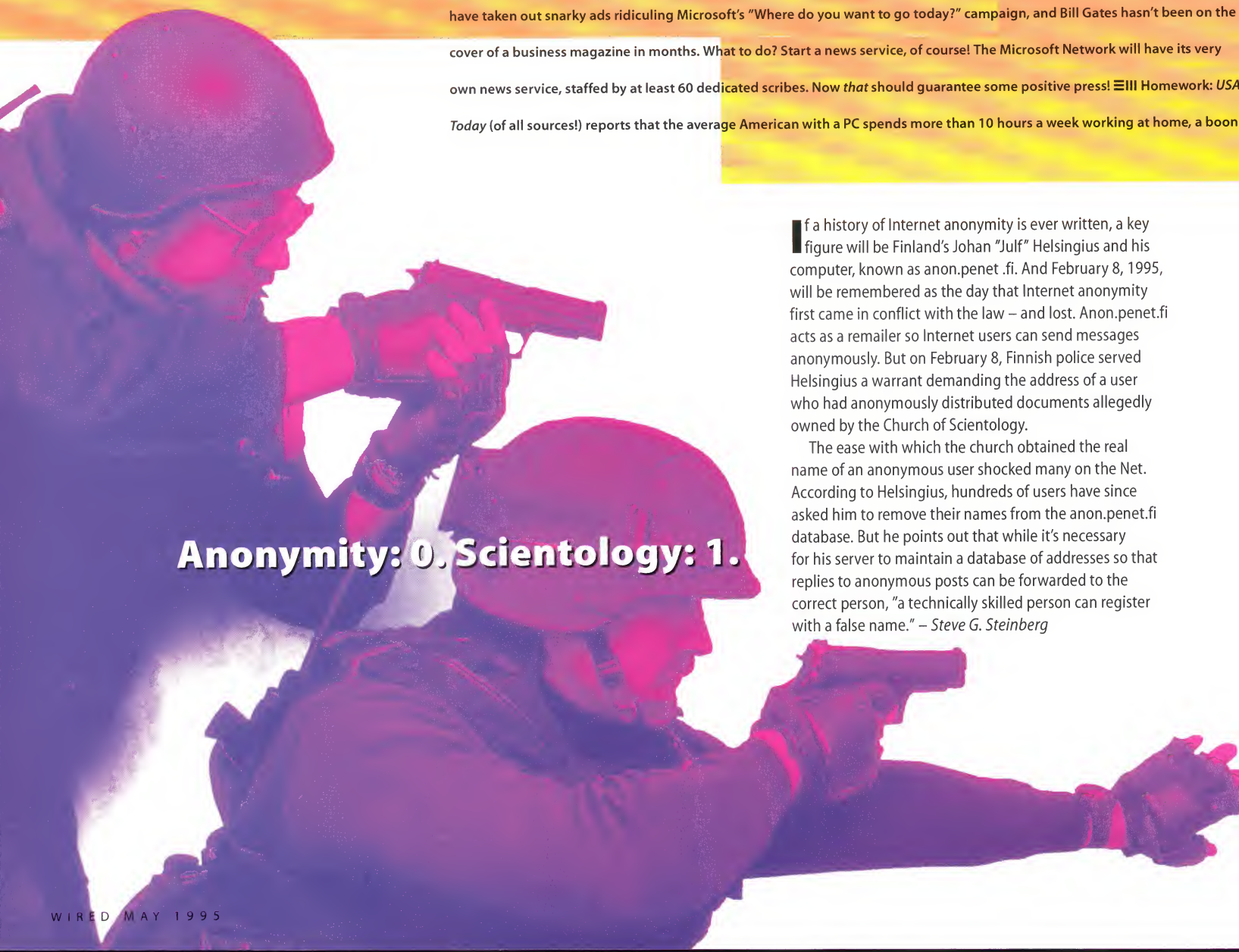
White Dwarf

The Internet as Ma Bell

If you and a friend both have Internet access, you can chat long distance for free. Hardware vendors, especially Apple, have inadvertently thrown this market into overdrive by equipping home PC models with microphones and answering-machine technology. The necessary software is available via ftp to anyone with the brains to grab it. Now that the genie is out, this technology is going to have an exponential effect. Forget alt.sex newsgroups: telephony is the killer app that drags the government into regulating the Net as the telcos scream murder and beg for relief. Unfortunately for them, the "inter" part of Internet means "international," and what Washington says doesn't always play in Paris, Prague, or Pakistan. A program for Mac is available at ftp *sumex-aim.stanford.edu* and *http://www.vocal tec.com.* – *Chris Clark*



► interface. But the appeals court found that Lotus's menu structure and command keys were "uncopyrightable subject matter." The upshot: it's going to be harder to copyright the "look and feel" of a particular application or interface. But the fight isn't over yet: Lotus is mulling over an appeal, possibly to the US Supreme Court. ☰III Microsoft Notwork: Microsoft continues its role as the World's Largest Target: it's the subject of two antitrust investigations (for the Microsoft Network and Video for Windows), a rogue judge is threatening to overturn the sweetheart deal it cut with the DOJ, and Bob, the idiot-proof user interface, has taken off like a lead zeppelin. WordPerfect and Lotus have taken out snarky ads ridiculing Microsoft's "Where do you want to go today?" campaign, and Bill Gates hasn't been on the cover of a business magazine in months. What to do? Start a news service, of course! The Microsoft Network will have its very own news service, staffed by at least 60 dedicated scribes. Now *that* should guarantee some positive press! ☰III Homework: *USA Today* (of all sources!) reports that the average American with a PC spends more than 10 hours a week working at home, a boon



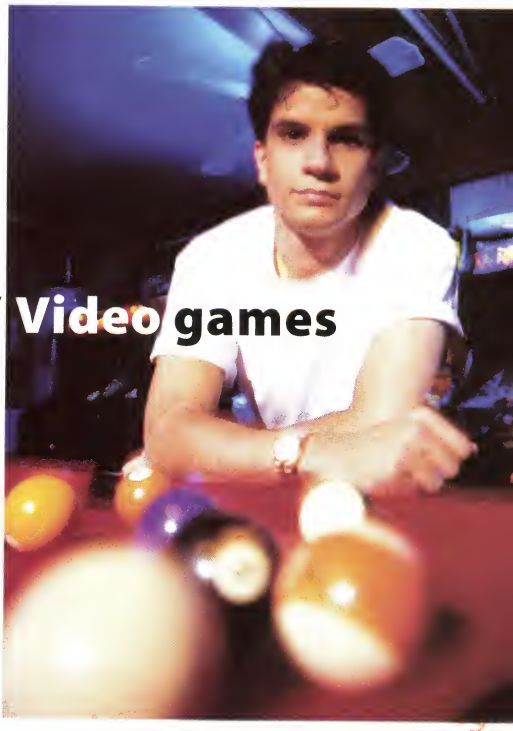
Anonymity: 0. Scientology: 1.

If a history of Internet anonymity is ever written, a key figure will be Finland's Johan "Julf" Helsingius and his computer, known as anon.penet .fi. And February 8, 1995, will be remembered as the day that Internet anonymity first came in conflict with the law – and lost. Anon.penet.fi acts as a remailer so Internet users can send messages anonymously. But on February 8, Finnish police served Helsingius a warrant demanding the address of a user who had anonymously distributed documents allegedly owned by the Church of Scientology.

The ease with which the church obtained the real name of an anonymous user shocked many on the Net. According to Helsingius, hundreds of users have since asked him to remove their names from the anon.penet.fi database. But he points out that while it's necessary for his server to maintain a database of addresses so that replies to anonymous posts can be forwarded to the correct person, "a technically skilled person can register with a false name." – *Steve G. Steinberg*

TIRED	WIRED
NYPD Blue	*Homicide*
Porn stars in porn videos	Porn stars on network TV
CD-ROM	AVCD
Woodstock's 25th	Bitches Brew's 25th
Betty Page	Bunny Yeager
Prozac	Zoloft
Janet Jackson	Luscious Jackson
Talk Soup	*Politically Incorrect*
Artificial intelligence	Collective intelligence
Text sex	CU-SeeMe sex
Michael Jordan in Nike ads	Janis Joplin in Mercedes-Benz ads
Mitnick	LaMacchia
Bingaman	Sporkin
Hip Hop	Trip Hop
Microsoft Network	WebRunner
Manhattan	Salt Lake City

Rock 'n' Roll 'n' Video games



Over the past four years, 25-year-old videogame soundtrack composer Tommy Tallarico has won rave reviews and a cult following for his work on nearly three dozen videogames.

Tallarico's big break came in 1991 while working at a Santa Ana music store, where he bumped into a Virgin Interactive Entertainment game designer. Tallarico was hired the next day and went on to put together music and sound effects for more than 30 Virgin titles.

After releasing an album on Capitol Records (*Tommy Tallarico: Virgin Games Greatest Hits Volume One*) and forming his own recording studio, Tallarico is now hard at work on new soundtracks for Electronic Arts, Playmates, Virgin, and Capcom. "I don't need the money," he boasts. "At this point, I can do just the projects I want to do." – *Zach Meston*

for US productivity as compared with other countries. ☰III Web Facts: Sun Microsystems, one of the earliest Web sites around, reports that there are now more than 27,000 WWW sites, and the overall population is doubling every 53 days. ☰III Caught in the Web Hype: Here's a wonderful note from a miffed Prodigy user: I'm dreadfully steamed because when I saw that Prodigy would offer WWW services (in a *New York Times* advertisement), I called the damned company, ordered the starter kit, got it home, installed it, tinkered around with what I found to be an ugly and overly commercial interface, and then took 20 minutes to find (not easy, BTW) and set up the WWW service. That's 20 minutes of mounting frustration – only to *finally* get a dialog box that says, "You can't use WWW without Windows software." Huh? So ►

Spielberg's List

Schindler's List, Steven Spielberg's epic tale of human triumph against adversity, reenacted the experiences of European Jews during the Holocaust. Now Spielberg wants to give the real-life survivors of those times a voice. Along with *Schindler's List* producers Gerald Molen and Branko Lustig, Spielberg has founded the Survivors of the Shoah Visual History Foundation to create a videotape database of their stories.

Survivors of the Shoah is working in conjunction with Holocaust scholars, oral historians, and institutions such as the Museum of Jewish Heritage, the US Holocaust Memorial Museum, and Israel's Yad Vashem. More than 2,000 hours of video – indexed by key words, subjects, and phrases – will be digitized and made available to educators and museums via an interactive network. Survivors of the Shoah Visual History Foundation: (800) 661 2092. – *Matt Haber*

TOMMY TALLARICO: KINO VILLAND; LIST FROM: RG-20.003*01, THE OSKAR SCHINDLER PAPERS, UNITED STATES HOLOCAUST RESEARCH INSTITUTE ARCHIVES; FACING PAGE: STORMTROOPERS: ED LALLO/LIAISON INTERNATIONAL

Font Noir

"My fetish with fonts began in kindergarten, when I was inspired by the letters of the alphabet that ran above the chalkboard," says Marcus Burlile, who started RawTypes Fonts three years ago.

Burlile has stretched the boundaries of typeface design by creating character dingbat fonts that he says are a result of personal exploration. "I wanted to add a wider variety to the character icons out there. Instead of using a smiley face, I'd rather use something more amusing, something that focuses on expressions of life, different viewpoints, and the darker side of comedy." RawTypes's droll fonts include "Relatives," which offers 66 icons of toothless, bespectacled yokels; "Deadbugs," a collection of squashed or humanized bugs; and the ghoulish "Widows," which includes a bottle of pills, a shovel, a pitchfork, and sinister-looking dowagers. RawTypes Fonts: +1 (703) 451 0873. – *Carla Sinclair*

► I went back to the *NYT* advertisement and the documentation they sent me with the kit, and found absolutely nothing about Windows software (I use a Mac). Then I called the tech support, which is also irritatingly cheesy, and *finally* got through to a woman who said, "You're right – no WWW without Windows." I asked her to double-check her materials, and she said, "Well, you're right again, nothing we have here mentions that, but it's true." ☰III Junk Suit: CompuServe member Robert Arkow is sick of junk e-mail, so he's doing something about it: earlier this year, he filed suit against CompuServe under the Telephone Consumer Privacy Protection Act of 1991, which prohibits automatic calling "for which the calling party is charged for the call." He claims that since he pays for his CompuServe account, he has a right to force CompuServe to stop sending him spam. We'll keep you posted. ☰III

Chip Monks

Tired of trying to wring productivity out of those twentysomething office temps? Try The Electronic Scriptorium, a Virginia-based labor-services company that farms out computer work to 30 monks pursuing ecclesiastical studies at six American monasteries. Not only are the monks squeaky-clean and hard-working, they also come with some pretty impressive references. They've already digitized medical records at Johns Hopkins University and computerized a card catalog at Yale's undergraduate library. Now, they're building an index of 2 million photographs on file at the *New York Daily News*. – *Todd Lappin*

MONKS: ARCHIVE PHOTOS

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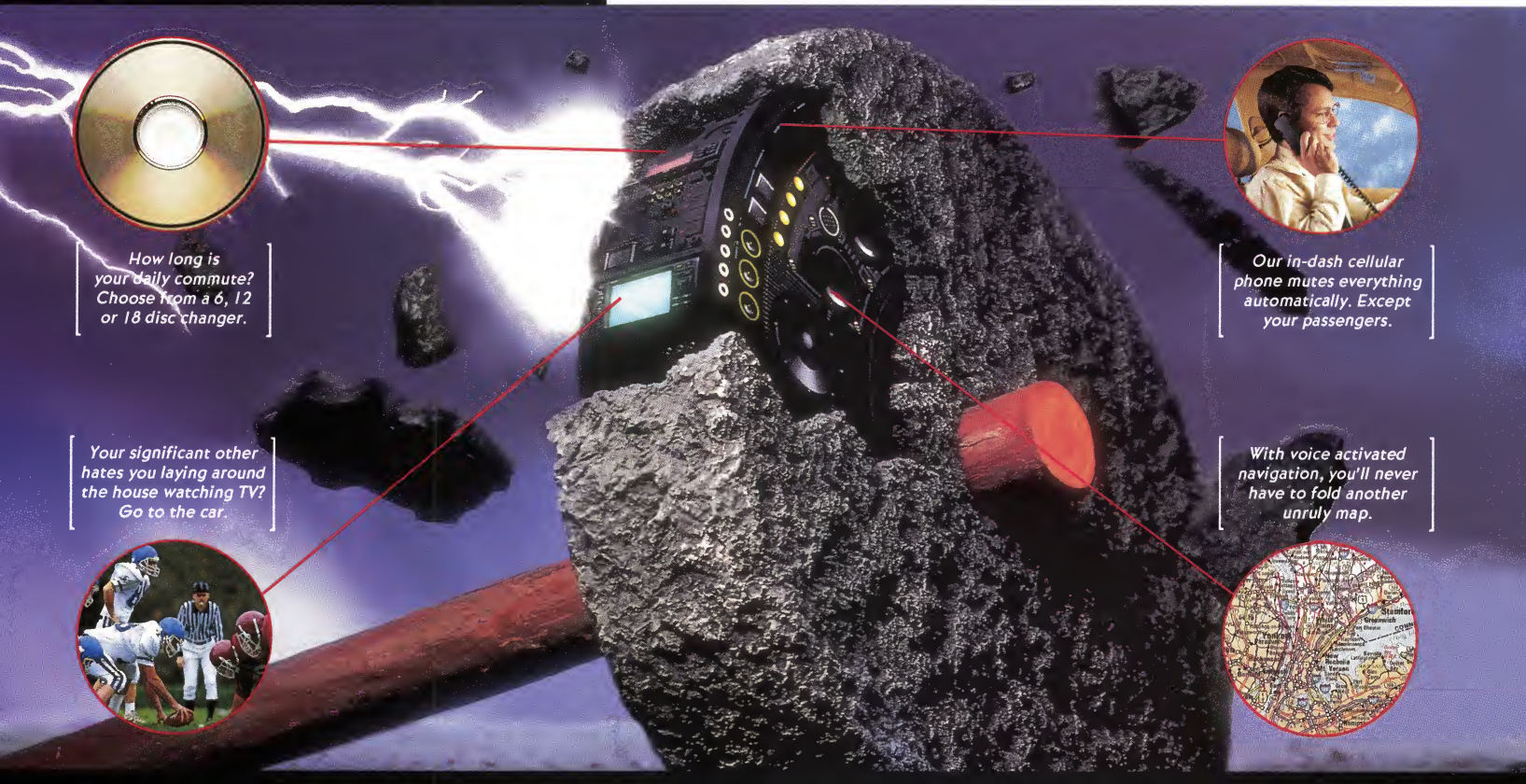

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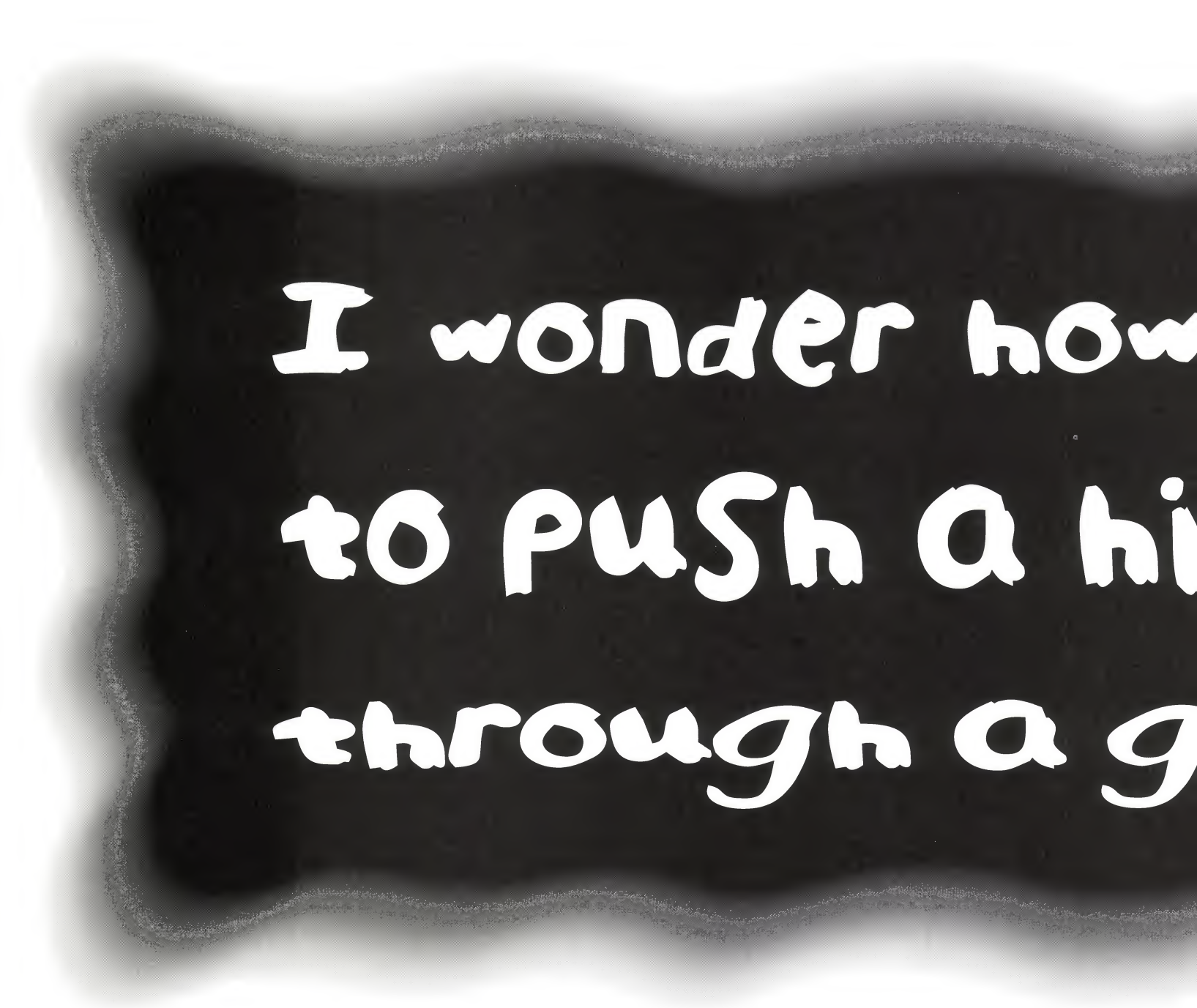

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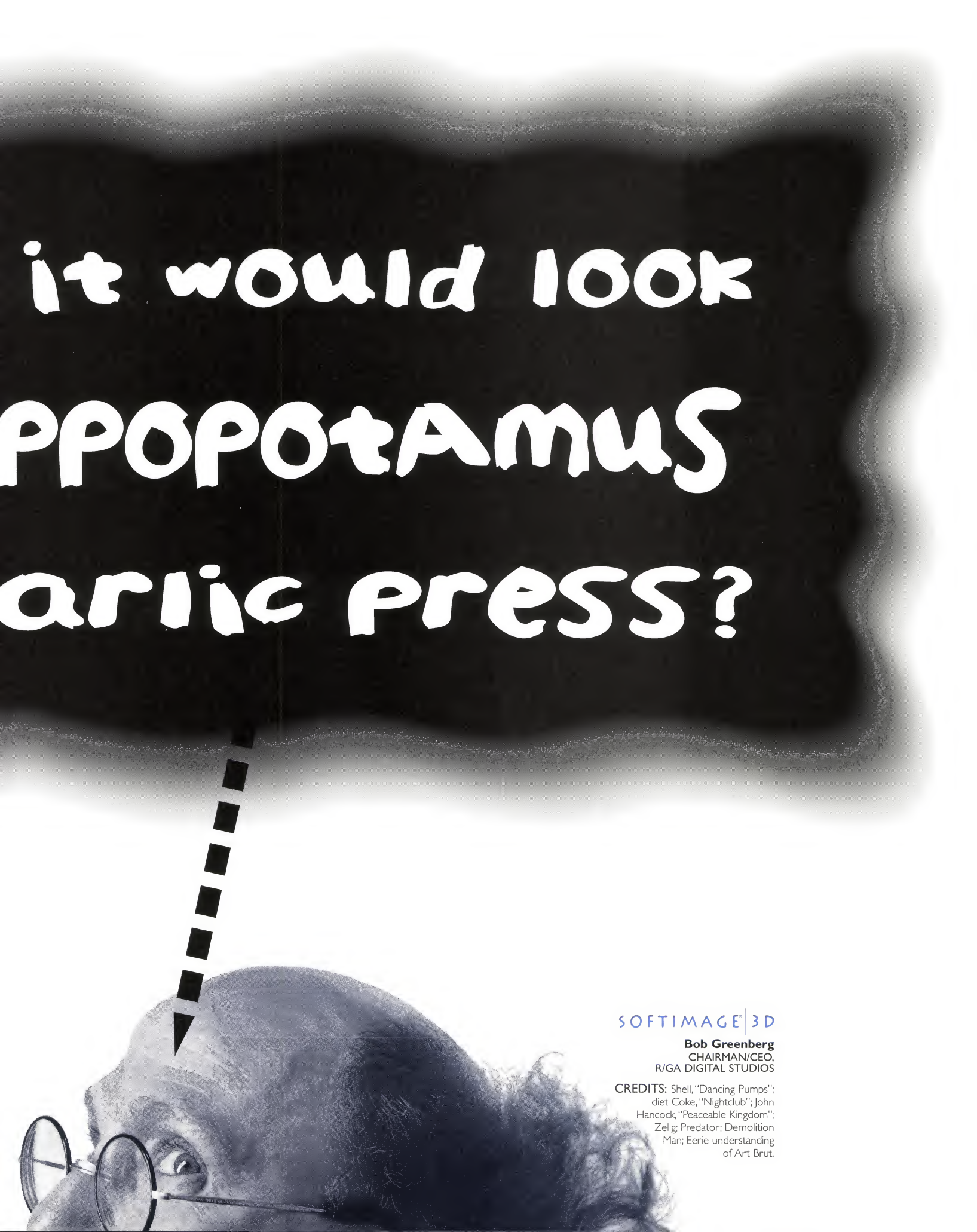

SOFTIMAGE|3D

Bob Greenberg
CHAIRMAN/CEO,
R/GA DIGITAL STUDIOS

CREDITS: Shell, "Dancing Pumps"; diet Coke, "Nightclub"; John Hancock, "Peaceable Kingdom"; Zelig; Predator; Demolition Man; Eerie understanding of Art Brut.

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Smut Hut

You won't find a whole lot of smut at Bianca's Smut Shack. You won't find a whole lot of Bianca in that corner of the Web, either. What you will find, according to Jill Atkinson, one of the "Bianca Trolls" who runs the site, is "a nice, friendly, warped little place" that happens to harbor one of the liveliest house parties in cyberspace.

Head on over to Bianca's place – it's the best little smut shack in cyberspace.

At most Web sites, there isn't much more to do than passively observe. But at Bianca's, guests know they're in for something different the minute they open the primitive map and start wandering through the dozen rooms and nooks of the shack. Visitors will find themselves in the midst of a perpetual love fest where inhabitants can talk back to their hosts and to each other. "This is a totally participatory thing," explains co-founder Chris Miller.

Bianca's Smut Shack was started just over a year ago, when a small group of friends with an idea for a site stumbled upon a mysterious woman who became their inspiration. "There is a real Bianca," says Atkinson. "She doesn't want any pictures up. She prefers to be an anonymous muse." So, the devoted trolls do the housekeeping around Bianca's, with their namesake figurehead stopping by now and then to peek inside.

When the caretakers opened the bathroom for visitors to post graffiti, "the user feedback was so intense we started putting up other places in the shack where people could leave messages," explains Atkinson. "It's so cool that it's evolved into this community. It's totally user-generated." Now, partyers can swap Kool-Aid recipes in the guest book on the altar, flame Newt in the kitchen, or discuss their "daily dump" in the loo. It's prurient, perhaps, but hardly hard-core.

There is some smut to be found, if you know where to look. In the bathroom's communal stall, rapid-fire posting creates the closest thing you can get to a live group grope with Netscape. Those who prefer a subtler form of seduction can park their libidos in the chatty Pillow Talk Lounge.

Bianca's packed shelves include a fair amount of dirty stuff, but they also offer plenty of other titles. On the bookcase, there's information on alternative publishers like RE/Search and Loompanics. Sex-toy fun facts, provided by San Francisco's Good Vibrations store, are in the bedroom. In the movie room, guests post their own reviews of current releases, both explicit and mainstream.

Right now, the shack is an ongoing, all-consuming labor of lust for its landlords. "We do it in our spare time," says Miller's partner, Dave Thau. "We get a kick out of it." Server and connection time is donated by the folks at commercial Web-page developer ThoughtPort Authority "out of the goodness of their hearts" and in exchange for a mention on the smut shack site. Since ThoughtPort's computers are not the fastest, and system crashes are an all-too-regular occurrence, a "Keep Bianca Open" fund has been set up for the acquisition of new equipment.

As long as guests keep dropping by, and as long as the system can hold them, Bianca's will keep on sprawling. "It's developing out of our control," says Miller with pride. "It's unstoppable now." What started out as a humble shack in the wilderness of the Web has evolved into a prime piece of virtual real estate. – *Mary Elizabeth Williams*

Bianca's Smut Shack: *http://bianca.com/shack/*

DaveNet

Dave Winer likes to have fun. And one way he has fun is writing essays about computer platforms, sex roles, processor chips, and Aretha Franklin on DaveNet. The 39-year-old software developer launched the online experiment on a whim in October of 1994. Since that time, DaveNet has evolved into an influential salon for the digital cognoscenti – a mediated forum for lofty (but playful) big-picture discussions about computer-industry dynamics, music, or anything else that piques Dave's curiosity. DaveNet

Winer: A stand-up cultural critic for the digerati.

pobox

E-mail Trail

A new service called pobox.com offers an easy-to-remember e-mail address that you can use for the rest of your life (or the life of the company, anyway). For example, any mail sent to *mengwong@pobox.com* is forwarded to pobox.com founder Meng Weng Wong's CompuServe account *(71552.1674@compuserve.com)*. This way, if you switch online services, you don't need to message everyone you know informing them of your new e-mail address – just e-mail your new information to pobox.com. – *Mark Frauenfelder*

Price information: *pobox@pobox.com, http://pobox.com/pobox/signup.cgi.*

DANIEL FURON

Ever since she was a little girl, Anne Parker has wanted to fly. She signed up for flight training just as soon as she could. Climbed into most everything that had wings. Then she visited one of our retailers and test-piloted a Saturn SC2.

It must have been a successful sortie, because Anne bought the coupe and she's been conducting low-level maneuvers ever since. You can't compare it to pulling 9 g's in a jet—"That would be silly," says Anne—but with its 124-horsepower, 16-valve dual-overhead-cam engine, well, it's still quite a thrill.

Especially now. See, Anne's not piloting planes anymore. A promotion has landed her behind a desk in San Antonio. A good job—air crew selection research. Then again, it's not exactly the same as throttling up at 30,000 feet.

All the more reason why she likes her Saturn. From where she sits, the gauges are easy to read, the controls are well-placed and the AM/FM stereo and cassette deck come through loud and clear.

Still, as Anne says, comparing a Saturn to a jet is a bit of a stretch. That supersonic number goes for about $25 million. The SC2? Well, you'll see it's considerably less.

The cockpit of an F-16 and Anne Parker's Saturn SC2 are so
an eject button. (Okay, so ours is or

Anne Parker is pictured with a 1995 Saturn SC2. M.S.R.P. for the 1995 Saturn SC2 is $14,855, including retailer prep, sunroof, automatic transmission and cassette player with equalizer. Tax, license, transportation and other options are extra. For more information on Saturn cars, please call us any time at 1-800-522-5000. © 1994 Saturn Corporation.

Anne Parker was cleared for takeoff at Saturn of Austin.

similar they both have
the tape player.)

We'd like to think that the reason an accomplished pilot drives a Saturn has something (okay, a lot) to do with performance. In fact, to make an affordable sports car feel more "sporty" than

"affordable," we've optimized the gear ratios to enhance acceleration while still delivering good fuel economy. And we've reduced the drag coefficient from .323 to .315. Hey, every little bit counts in supersonic planes and sport coupes.

SATURN

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may seem whimsical, but remember this: Bill Gates, Michael Spindler, and Esther Dyson have been known to respond directly to his rantings.

Dave calls his forum an "essaynet," and it works something like this: once or twice a week, Dave writes an essay about whatever is getting under his skin. Computers. Love songs. Intelgate. Whatever. Then he e-mails his essays out to a "very large number" of DaveNet subscribers. (Dave won't say exactly how many subscribers he has, but joining DaveNet is free.) The messages go out in randomly compiled batches of eight DaveNet addressees. So, when you receive Dave's latest rant, you'll also find the addresses of seven other randomly selected DaveNet subscribers listed in the message header.

Dave encourages each group of eight to coalesce into a mini-salon and exchange reactions to whatever Dave had to say. When the comments really start to pour in, Dave makes it a practice to compile the most interesting reactions and redistribute them to the entire DaveNet mailing.

It's all pretty simple, really. No computer-enhanced bells and whistles. No gee-whiz JPEGs. Just ASCII and a few intriguing ideas. As one devoted DaveNet fan described the essaynet, it's nothing more than "a community that is essentially faceless except for the local 'gang of eight.' A wide-area broadcast with a letters section, a benevolent editor with wide-reaching powers, and an editorial voice like a kid in a candy store."

The kid-in-a-candy-store part is what makes DaveNet such a giggle. You never know what Dave will unload next. "Platform is Chinese Household," for example, has already become a DaveNet classic. Sent out last October, the essay blasts Apple Computer for treating independent software vendors like menial hired help. "Today Macintosh is an empty, loveless house, not a home," Dave wrote. "All the developers walked, but left the babies behind.

"Not because of market share – that can be fixed with economic tweaks. We walked because Apple is a lousy lover."

You see, Dave Winer is also a software developer. He was doing pretty well for himself just a few years ago with his Frontier scripting program for the Macintosh – until Apple killed his business by introducing AppleScript.

Bummer. Yet that experience is part of the reason why Dave's sideways insights into the computer industry seem so authentic. It all comes straight from the heart.

"DaveNet is more than just a soap box," Dave says. "As things move forward, it begets other things. Other opportunities open up. In time, there will be other Daves, and other topics, and other people. I'm going to encourage that."

How? With AutoWeb 1.0, Dave's latest software production. He describes it as an automated newsroom system for people who want to publish on the World Wide Web. Dave feels it's about time Web publishers were given the opportunity to focus on creating fun content and context, instead of getting mired in all the grit and gore of HTML.

"At the same time that I'm writing for DaveNet, I'm also working on all the software and technology that's behind DaveNet," he says. "From a software standpoint, there won't be any hassles for other people who want to create their own DaveNets. All this is broader than DaveNet. Much broader." – *Todd Lappin*

Watch Dave have fun at *http://www.hotwired.com/Staff/Userland*

Wired Top 10

Top 10 Zine Towns
(as tracked by the editors of *Factsheet Five*)

City	Total Number of Zines	Total Population (in Thousands)	Zines per 1 Million People
1. Berkeley, California	78	103	757
2. Olympia, Washington	25	34	735
3. San Francisco, California	336	723	465
4. San Diego, California	43	110	391
5. Santa Cruz, California	18	49	367
6. Seattle, Washington	188	516	364
7. Athens, Georgia	14	46	304
8. Boulder, Colorado	25	83	301
9. Cambridge, Massachusetts	28	96	292
10. Minneapolis, Minnesota	100	368	272

Operative definition of zine: a small amateur publication usually produced out of passion, rarely making a profit or breaking even.

Source: *Factsheet Five* (Issue #54), P.O. Box 170099, San Francisco, CA 94117-0099. Sample issue: US$6. Subscription: $20 for six issues. +1 (415) 668 1781.

Digital Dead Man

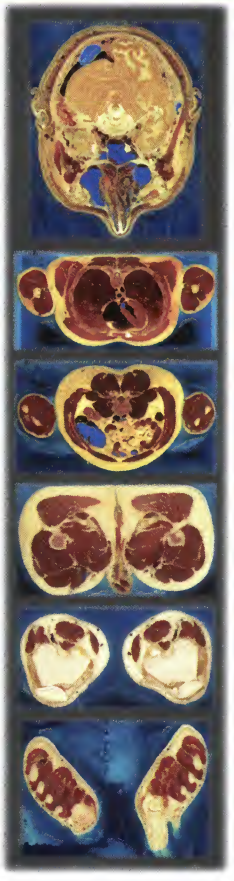
He may be gone, but he's not forgotten.

Scientists have used the cadaver of convicted murderer Joseph Jernigan to create the most detailed atlas of the human body ever assembled on a computer.

Funded by the National Library of Medicine, researchers at the University of Colorado embarked on an ambitious project: to digitize a complete human body. The result, the Visible Man, part of the Visible Human Project, is a computerized corpse assembled from photographs of cross-sections of Jernigan's body. Jernigan, executed by lethal injection in Texas in 1993, donated his body to science.

The research team, headed by scientists Victor Spitzer and David Whitlock, used a combination of specially designed milling and photography equipment to gather the visual data. The team sliced the body (which was frozen to ease cutting) into 1-millimeter cross sections. As each section was removed, the team photographed the newly exposed cross section of the body. By reassembling each of these slices digitally, the team was able to re-create Jernigan's body down to a 1-millimeter resolution. Using the computerized reconstruction, you can take a journey from the top of the head, through the center of the body, and down to the feet. Because it's been digitally reconstructed, the body can be viewed from any angle or sliced any way you'd like to see it.

Slices of life: Head, thorax, abdomen, pelvis, legs, and feet.



And the Visible Man isn't just for the medical élite: he's available for nothing over the Internet. Be warned, however: it would take around two uninterrupted weeks on a dedicated T1 line and a 16-Gbyte hard drive to download the 1,878 sections that make up the body. Users who want easy access to the complete image can also buy CD-ROMs of specific body parts for US$200 per CD.

The Visible Man solves the problem of previous 3-D medical mod-

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INSTRUMENTS FOR PROFESSIONALS

els, which were inherently hollow. "There is no previous 3-D model based on real anatomy – just projections by medical illustrators of where things should be," Spitzer explains. "The Visible Man is full – because he's real, you can cut into his leg and see the structure inside." – *Lynn Ginsburg*

The Visible Human Project: *http://www.nlm.nih.gov/extramural_research.dir/visible_human.html*

What on Earth

As of this April, students in classrooms equipped with TV cable service (free to many public schools) and Macs or PCs have been able students to download multimedia programs about world news events for US$100 a year. Produced by Reuters reporters and educators, Ingenius's "What on Earth" program delivers six interactive programs each day with text and CD-ROM-quality video and sound clips.

Students at 300 schools participating in the beta test recently saw "What on Earth" stories about Bosnia, the O.J. Simpson trial, and a history of jazz. The program should be available to the public by the time you read this.

– *Mark Frauenfelder*

Ingenius: (800) 772 6397, +1 (303) 721 1062.

Ed Anger Is Beer-Spittin' Mad

So there sits Ed Anger, watching the NFL on the tube, and what does he see but one of those 300-pound excuses for a football player limping off the field whining about an Astroturf burn. There you go – Ed has the next subject for his column, "My America," which runs in the *Weekly World News*.

"Today's Pro Football Players Are Sissies!" howls the headline over the column, which begins this way: "I damn near spit a mouthful of Old Milwaukee beer into Uncle O.V. Potter's bowl of popcorn last Sunday while watching pro football on the tube." Thank God, writes Ed, that Vince Lombardi isn't alive to see this farce. "He'd have ripped the big sissy's faceguard off his helmet with his head still in it and kicked his chubby butt through the goalposts."

Right-wing paranoia as performance art.

Reader, I'll be upfront with you, Oprah-like. I've been addicted to the *Weekly World News* since 1988, when it broke the news that Elvis was alive. After that, news was never the same for me. Though the *World News* has rarely gotten the credit it deserves for this journalistic coup, Elvis is now sighted almost hourly by lily-livered competitors. As if that scoop wasn't enough, the paper then reported the existence of Bat Boy, an alien toddler with a bald head and pointy ears who was found by a zoologist in West Virginia. Although the *News* reported – exclusively – that the bat child was captured by daring FBI agents after a "27-state reign of terror," he seems perpetually on the loose, spotted almost as frequently as Elvis and John F. Kennedy.

Ed Anger stands in stark counterpoint to his colleagues in the straight press – and I mean stark. If he were online, Ed Anger would be world-champion flamer, blasting cyberpest opponents across the Net. Anger's world is not chic, like cyber communications, and certainly not substantive, like the mainstream press. He'd never anchor the evening news or be nominated for any press association awards. And you can put your life's savings on this: pigeons will never roost on statues of him.

He is cheered on by something like 2 million readers. (The paper claims a circulation of about 500,000 and assumes a pass-along rate of about four.) *World News* editor Eddie Klontz says the paper is "violently" secretive about the real identity of Anger, but concedes, "I'm about as close to him as any human being is."

Although the paper's readership is believed to be predominantly working-class, Anger has had a cult following among bleeding-heart liberals, college students, and card-carrying members of the media élite for many years.

He is highly interactive, too, by print media standards. Anger receives around 700 letters per week, more than any other columnist at the paper and more than all but a handful of mainstream media pundits. His spot polls often draw 4,000 to 5,000 responses. One of the latest to enlist reader response (check the appropriate box and mail in the ballot): "Yes! I agree with Ed and Newt – welfare kids belong in orphanages that educate and care for children, giving them the love and support they need to become solid, happy, contributing members of society." Or: "No! Welfare kids belong on the streets with parents who abuse and neglect them until they're old enough to have children themselves – and collect welfare checks of their own."

When he's ticked, he tells you so, and in this great country, there's a lot to really piss him off.

Like the far-more-ponderous Rush Limbaugh, Anger is skeptical about the animal-rights movement. He proclaimed himself madder than Daniel Boone with a rusty musket over a "letter I just got from my local hunting and fishing club," inviting him on what might be one of the last great whale hunts because we're running out of whales. The headline shrieked, "I'm going huntin' for whale! Get 'em while you can, before the Japs kill 'em all." Anger's whale-hunting column has proved so popular, it's been reprinted when he's on vacation. "A whale is just another fish, for crying out loud. Just bigger, that's all," he rants. "I mean a whale's not a heckuva lot different than a 10-ton flounder, if you think about it."

Anger is happy about the Republican resurgence. The era promises such good times for Anger that he's campaigning for a Gingrich memorial, right in DC, like Jefferson's, Washington's, and Lincoln's. This idea was not offered in a typically arrogant media spirit but was accompanied by an Ed Anger poll: "Yes, I agree with Ed Anger that Newt Gingrich deserves to have the biggest memorial in Washington – and that we should break ground by June!" Or: "No! Ed Anger is an imbecile for thinking Newt Gingrich deserves his own memorial. A tombstone, maybe, but not a memorial."

It's hard to read Ed Anger without wondering why opinion in mass media has become so tepid and humorless. Klontz, in fact, can barely mention Ed's name without chuckling.

"The way I see it," he says, "once you read Ed or write in, you're hooked. You've lost your soul." This is the truth. If you don't want to have to stuff the *Weekly World News* surreptitiously underneath the Cheerios box in the supermarket and endure disapproving looks from the checkers, then don't buy the first one. – *Jon Katz*

WEEKLY WORLD NEWS

United States of Identification

It's called "work-site verification," and according to the Clinton administration, it's the best way to cut the number of illegals streaming into the United States. It means enforcing the laws that prohibit US employers from hiring illegal workers – and slapping heavy fines on those who do. Right now, work-site verification is a joke. Take a new job, and you can prove your status with any of 29 different forms of identification. Forgeries abound. So the bipartisan Com-

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PHIL JACKSON
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OF THE SEASON.

Before any basketball coach tries to emulate the winning ways of Coach Phil Jackson, they may want to take a peek inside his computer.

If they did, they'd see that Phil can do some pretty neat things. Like use his computer to review video of last night's game against New York. At the exact same time that he's e-mailing a respectful appeal to the League. Of course, being a game day, he's also, at the same time, using a Windows™ graphics program to jot down plays.

They might also note that Phil never has to worry about totally losing it (his programs, that is) if an application ever goes down. And that Phil can get on the Internet and other on-line services incredibly fast and easy, so he can get up-to-the-minute stats and injury reports.

In short, they'd see that Phil has OS/2 Warp, a new multitasking operating system that gives DOS and Windows programs amazing versatility. (And anyone who's ever seen Phil coach, knows he likes versatility.)

THE WORD "TECHNICAL" DOESN'T FAZE HIM.

Now, just so there's no confusion, Phil's not letting anyone take a peek inside his computer.

OS/2 Warp is available for under $90. (Or for just slightly more than the cost of a court-side seat.) To get warped, stop by your local software dealer, or call 1 800 3 IBM-OS2. Ask for a free demo disk.

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mission on Immigration Reform has a simple solution: "A computerized registry based on the social security number," says former US Representative Barbara Jordan, who chaired the commission.

Details are shaky. One possibility is a toll-free number that would connect employers to a computer set up by the Social Security Administration and the Immigration and Naturalization Service. On your first day at a new job, your boss would call the number, then type in your social security number. Your boss would then hand you the phone so you could dial your mother's maiden name (already in the Social Security Administration's database) as a "PIN." Just like a credit card, your boss would then get either an authorization code or a rejection.

Nobody can be sure whether such a national system would work. There are, after all, 50 million people in the US who start new jobs every year. So, the administration wants a series of trials to take place in the five states with the highest levels of illegal immigration: California, Texas, Florida, New York, and Illinois.

"The pilots could begin this calendar year," says Phil Gambino, a press officer with the Social Security Administration.

Cecilia Muñoz, a policy analyst with the National Council of La Raza, a Latino advocacy group, is worried that employers might use the system as a tool for discrimination. "What is going to prevent the employer from screening out job applicants?" she asks.

The most vehement opposition to the database is not from liberal groups but from libertarian organizations, such as the Cato Institute, and conservatives. "A computerized registry system will lead inexorably to a government-issued national identification card," said House Majority Leader Dick Armey (R-Texas). Once the system is in place, he added, employers will need identification cards to verify workers' social security numbers. "Whether to administer government health care or stop immigration, a national ID card is a radical expansion of government power. All who oppose big government should oppose this very dangerous idea." – *Simson L. Garfinkel*

Jargon Watch

Cof$
Abbreviation for the Church of Scientology, used by its detractors on the alt.religion.scientology newsgroup.

Graybar Land
The place you go while you're staring at a computer that's processing something very slowly (while you watch the gray progress bar creep across your screen). "I was in graybar land for what seemed like hours, thanks to that CAD rendering." Compare with Render Wander (see Jargon Watch, *Wired* 2.12).

Juice a Brick
To recharge the big, heavy NiCad batteries used in portable video cameras. "You better start juicing those bricks, we've got a long shoot tomorrow."

Open-Collar Workers
People who work at home or telecommute.

Sacrificial Host
A computer server placed outside an organization's Internet fire wall to provide a service that might otherwise compromise the local net's security. Spotted in Cheswick & Bellovin's *Firewalls and Internet Security*.

Shopper-Lifting
When a store's electronic scanner (usually inadvertently) prices an item higher than the price noted on the store's shelf or in an advertisement.

Squirt the Bird
To transmit a signal up to a satellite. "Crew and talent are ready ... what time do we squirt the bird?"

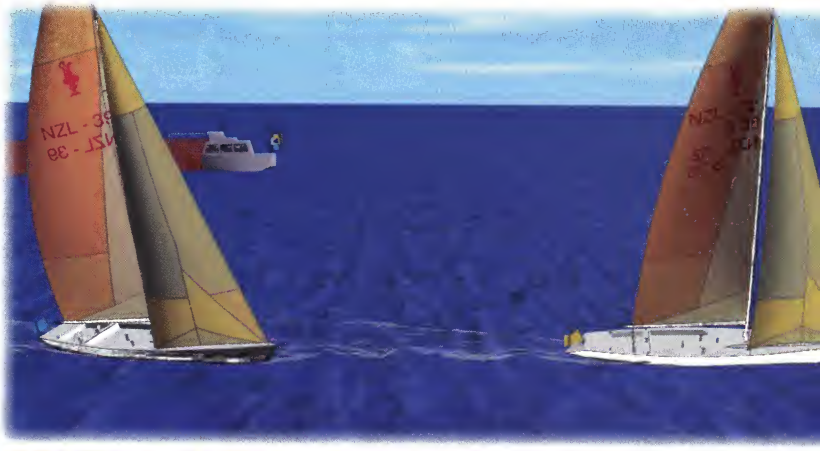
– *Gareth Branwyn*

A tip o' the porkpie hat to Orrin Anderson, Adam Ford, Kevin Kelly, Will Kreth, Robert Lauriston, and Dan Pink.

Virtual Racing for the America's Cup

Living up to the America's Cup's 150-year-old reputation as a showcase for techno-wizardry, this year's breakthrough is likely to shift from shaving valuable seconds off starboard tacks to setting a new standard in sports communications: the world's première yachting Cup is going virtual.

The America's Cup is a promoter's dream. It offers roughly 400 individual races; superbly crafted, giant yachts off San Diego; and several months in a warm-weather mix of sun and sea. The Louis Vuitton Challenger Cup phase comes first, during which seven adversaries from five countries – France, Japan, Spain, Australia, and New Zealand – battle to see who gets a crack at the San Diego Yacht Club, the current Cup holder. Next, three defending yachts compete against each other in the Citizen Cup phase to determine who has the honor of defending the silver pitcher that crowns the competition. Finally, a single challenger will fight against a single defender – the America's Cup proper, scheduled for early May.



Using VR and satellites to turn the America's Cup into a cartoon.

But while spectators at a football game can see the agony and the ecstasy of human endurance, and motor-racing buffs can taste the acid *frisson* of danger on the track, yacht racing is so technique-driven as to be almost inaccessible: the beauty of the exercise appears to be coded in an arcane combination of high-tech preparation, precision tactics, random winds, and split-second decisions aboard look-alike US$80 million boats. You can't really tell whether the competition revolves around gadgetry or team spirit. How, then, can the insider know-how that seems to drive the event be communicated to a watching world?

The latest solution is to turn it into a virtual sport. Parisian luxury travel-goods house Louis Vuitton, which has organized the challenger heats for the Cup since 1983, is sponsoring a media setup. All the yachts and marker buoys will be monitored by a global positioning system. Data will be transferred via satellite to ISDN lines so viewers in special Cup Press Centers set up in San Diego, Sydney, Paris, and Tokyo will see a cartoonlike version of the race onscreen. Shooting angles can be shifted, virtual cameras can film the scene from any viewpoint, and viewers can track wind direction and distance from the winning post. The technology will be a mix of Trimble Global Positioning Systems, Silicon Graphics hardware, and special race software developed and coordinated by Medialab (a French VR firm).

The system won't be a "Skipper Your Own America's Cup Yacht" VR arcade game, nor will it be sophisticated enough to sense and depict such events as the Australian yacht's splitting in half during the race: its real goal is to boost reporters' grasp of what is going on in a highly tactical sport. But with an event that consistently prides itself on breaking new technological ground, the likelihood of someone coming up with a simulated Cup race for confirmed landlubbers is already looking good. – *Andrew Joscelyne*

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FETISH

Edited by David Jacobs

Talking on Sunshine

The SOLARLIFE solar-charging battery will give your Motorola cellular flip phone plenty of staying power. It will recharge whether it's attached to the phone or not – just stick it in the sun and wait eight hours. But the real benefit comes from being able to leave your phone in standby mode all day without running out of juice; just make sure the surface of the battery is catching rays. The SOLARLIFE's built-in power management system continually checks charging and discharging, gets rid of pesky memory problems, and gives the battery a longer life. SOLARLIFE: US$129. Bel-Sound Inc.: +1 (201) 288 1685.

Robo Joystick

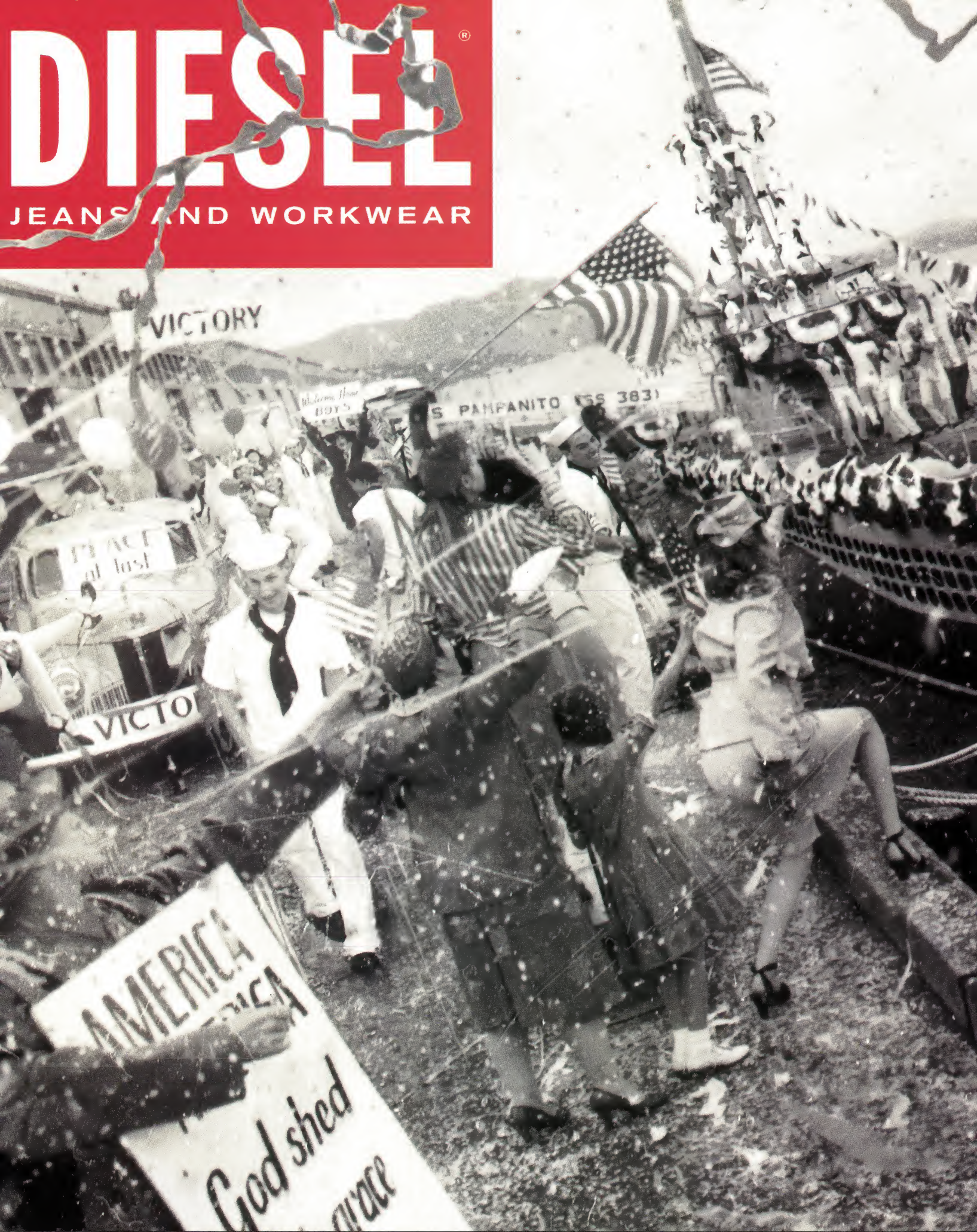
The Future Joystick is like one of those Japanese robots that cleverly folds and unfolds into different creatures. Open out the steering wheel, and you've got motorcycle handlebars; another tweak and you'll have an airplane joystick. Compatible with most PC games and all IBM-compatible computers, the joystick comes with a connector for adding a second joystick, software to control sensitivity, a demo videotape, and a race car game. The Future Joystick: US$139-$199. D.I.T. Export-Import Company Inc.: (800) 960 6077, +1 (213) 663 4096.

Tap into the Center

It's easy to become addicted to the AT&T Two-Line Personal Information Center – it can store up to 200 autodial numbers. Combining an LCD, keyboard, and speakerphone, this gadget features six programmable phone directories and up to 50 audio/visual indicators to remind you of important dates piling up on your calendar. The large LCD can also display each caller's ID (with time and date received). You can even set the lines to have different rings. AT&T Two-Line Personal Information Center 882: US$199. AT&T Corp.: (800) 222 3111.

Stamp Act

Everybody loves to use rubber stamps. Maybe it's the satisfying thunk they make when they hit the paper. The STAMP-CREATOR by Brother allows you to create your very own "seal." With a choice of 163 symbols, three fonts, and 30 templates of premade stamps, the STAMPCREATOR manufactures stamps by melting tiny holes through a thin layer of film. The system comes with three different stamp sizes, giving you up to nine lines of vertical or horizontal copy on a stamp. P-Touch STAMPCREATOR: Approximately US$300. Brother International Corporation: +1 (908) 356 8880, ext. 4307.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The HDC 451 headphones from Sennheiser make your music sound sweeter and give your ears a break by reducing potentially damaging low frequencies. The headphones work wonders with their tiny mics in each cup. The mics monitor the acoustic environment and cut out frequencies between 400 and 1,000 Hz – the ones that cause those frustrating disturbances. With a frequency response of 20 to 18,000 Hz, an impedance of 270 ohms, and a distortion rate of only 1 percent, you'll hear music or news more clearly no matter where you are. HDC 451 headphones: US$249. Sennheiser: +1 (203) 434 9190.

Crayons for Grown-ups

The new 600-by-300-dpi Phaser 340 from Tektronix is the world's fastest solid-ink color printer. Tektronix's RISC-based architecture speeds PostScript output allowing you to print at an amazing rate of four pages per minute on plain paper. The solid-ink ColorStix provides long-lasting color and idiot-proof installation without component maintenance or messy toners; you'll also have no more annoying color bleeds, fading, or fuzzy text to worry about. Phaser 340 color printer: Approximately US$5,000. Tektronix Inc.: (800) 835 6100, +1 (503) 682 7377.

Compute by Radio

The CruisePad looks just like a big-screen Newton, but it's really a wireless remote interface for comfortably controlling your desktop computer from as far away as 500 feet, or a whopping 1,000 feet in open areas. It has a backlit screen, transfers data at 1.6 Mbits per second, and is designed to be held in one hand. You can enter data using a configurable onscreen keyboard or a stylus. Pop it on your desktop, and you can plug it into a full-sized external keyboard. CruisePad: US$1,399. Zenith Data Systems: (800) 582 0524, +1 (708) 808 5000.

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Currently in use by foreign military, search and rescue teams, and other emergency personnel in the toughest of environments, the Aquapac will keep your cellular phone safe from salt water, snow, sand, and wind. The APQ-M2, which looks like a Ziploc bag with room for an antenna, was designed by Aquaman UK. Just slip the phone in the bag, and start making calls while shooting down the rapids. Even if you lose your grip and the phone plunges into the icy drink, the perky Aquapac will bring it bobbing up to the surface. APQ-M2: US$24.95. Aquapac USA: (800) 551 0966, +44 (71) 738 4466.

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Digital Digits

Remember Nintendo's Powerglove, that VR-type videogame controller that used chirps of ultrasound to track your hand's location? Although a great idea at the time, it was too complicated to connect, let alone calibrate and program. The Glove, from Anaphase, offers a much simpler solution: it uses the best of existing game-controller technology. With pressure-sensitive materials implanted in the wrist and fingers to register movement and button control, The Glove is like a standard game controller, only you can stick your hand right in it. The Glove: Under US$100. Anaphase Unlimited Inc.: +1 (516) 671 2456.

Signal Grabber

The best way to view broadcast TV is with the TV-15 antenna from Terk Technologies. It has horizontally arrayed, non-telescoping dual-rod antennae, with frequency-matching technology, that give exceptional performance on most broadcast channels. Terk's Pin-Dot Pre-Tuning control and an antenna-or-video source selector make it easy to switch between off-air reception and video sources like your camcorder. TV-15 antenna: US$39.95. Terk Technologies: (800) 942 8375, +1 (516) 756 6000.

The Home Audience Is Listening

Onkyo's TX-SV919THX is the first audio/video receiver to meet Lucasfilm's THX standards for home theater sound. You can set it for different surround modes – theater, concert hall, stadium, nightclub, arena, open air – or create your own surround mode and save it in the battery-free memory backup. The exclusive "Academy Filter" helps enhance monaural soundtracks. The TX comes with two remote controls: a large programmable control for button freaks and a smaller, simple unit that handles the receiver's most frequently used functions. TX-SV919 THX receiver: US$1,996. Onkyo USA Corp.: +1 (201) 825 7950.

Multi-Monitor

Here's a color display screen to suit any situation. The FV-600 from Casio combines an internal speaker and 10-inch LCD video monitor, a rear-screen projection system capable of displaying a 10- to 100-inch image, and all the necessary hardware to hook it up to any video signal. For on-the-road demos, the 13-pound FV-600 works with an optional 60-inch transportable screen that weighs only 10 pounds. FV-600 MEGA VISION: US$1,950. Casio Inc.: (800) 962 2746, +1 (201) 361 5400.

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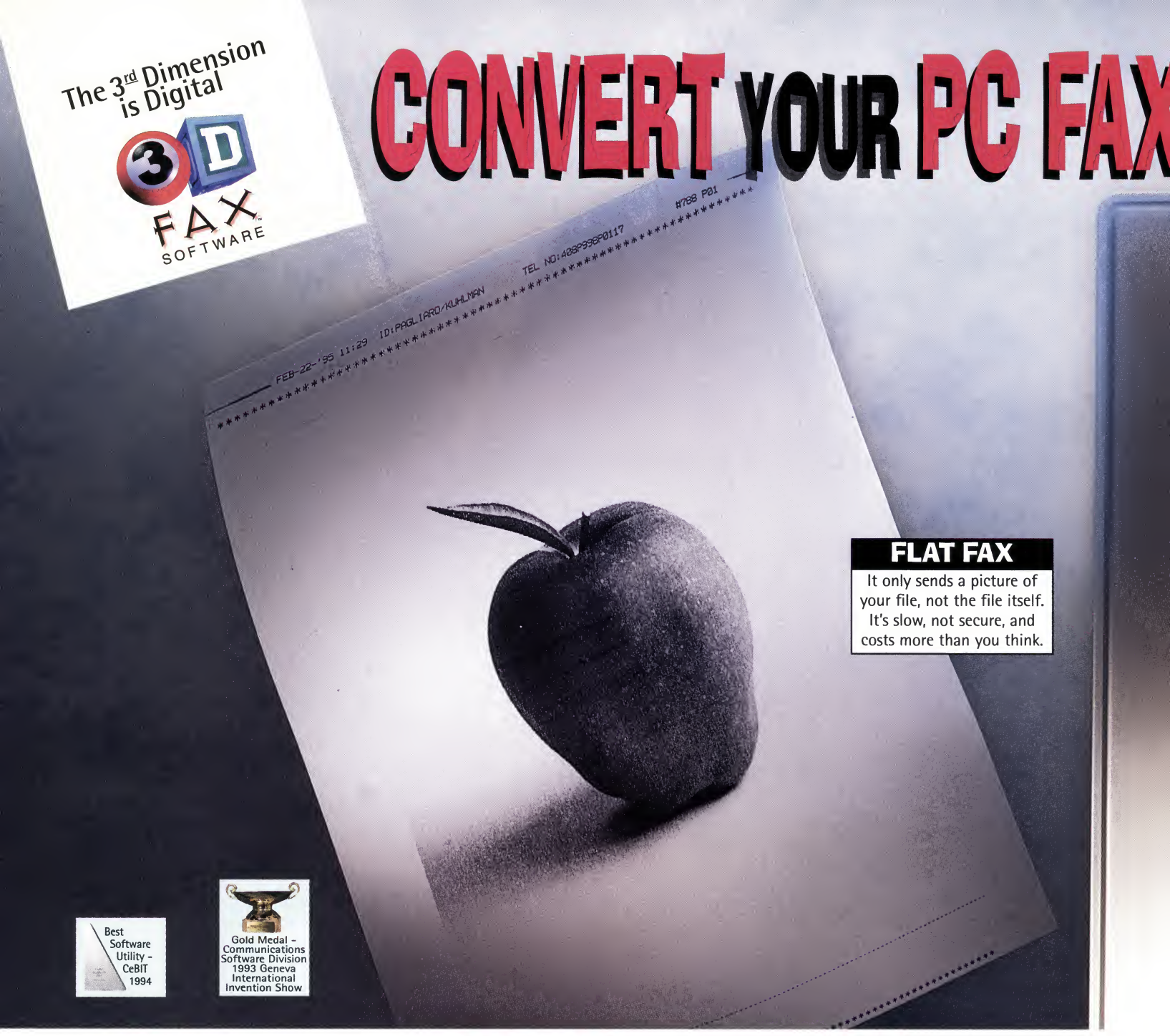

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The Future of Solar Energy

You've heard the hype. We asked the experts. Here's the *real* timetable.

Every year, approximately 2.5 million exajoules of solar energy reach the Earth. That's about 6,000 times the amount of energy consumed by people each year. While solar-energy lobbying has slowed since its peak in the late 1970s, scientists have continued to develop new technologies to use the sun as a cost-effective and environmentally friendly power plant. But economic viability has remained tantalizingly out of reach. *Wired* asked five experts to shed some light on the future of solar-power technology. – *David Pescovitz*

	5 Cents per Kilowatt-Hour	50 Percent Efficiency	Photovoltaic Roof Shingles	Solar-Assisted Automobiles	Space-Based Generator
Christopher Flavin	2005	unlikely	1998	2002	unlikely
Frank Goodman	2005	2035	1995	2010	2030
NREL	2010	unlikely	1995	1998	unlikely
Donald Osborn	2000	2000	1996	1998	unlikely
Steven Strong	2002	2010	1996	1997	unlikely
Bottom Line	**2004**	**2035**	**1996**	**2001**	**unlikely**

Christopher Flavin
vice president for research, Worldwatch Institute; co-author, *Power Surge*

Although current solar technologies provide power at around 9 cents per kilowatt-hour – a US nickel more than gas-generated electricity – our experts believe that in 10 years, power from the sun will be economically competitive. Flavin thinks a 5-cents-per-kilowatt-hour price point might be reached by using new thin-film solar cells. Thin film, less than 1 micrometer thick, is cheaper to manufacture, store, and ship than conventional solar cells. Strong points out that last year, Enron, a large US natural gas company, announced plans to build a photovoltaic power plant with power at 5.5 cents per kilowatt-hour. However, according to Flavin, that rate is "based on special tax breaks."

Frank Goodman
manager, photovoltaic technology and applications, Electric Power Research Institute

National Renewable Energy Laboratory – photovoltaics division
Thomas Surek, program manager; Mark Fitzgerald, communications coordinator

One way to lower the cost of solar power is to increase its efficiency. The National Renewable Energy Laboratory holds the efficiency record with a solar cell that converts 29.5 percent of the sunlight that hits it into electricity. But Surek and Fitzgerald point out that this was achieved only by using different layers of photovoltaic material that capture distinct parts of the light spectrum, a method Osborn thinks is the most likely way to increase solar-cell efficiency to 50 percent. Strong points out that while research is being done on an antenna array that intercepts light waves and converts them into AC electricity with a theoretical 80 percent efficiency, no one has been able to build such a device. Agreeing with several other experts, he points out that generally, "higher efficiency will come at too high a price."

Donald Osborn
supervisor, Sacramento Municipal Utility District, solar program

Steven Strong
president, Solar Design Associates Inc.

Our experts point out that several companies in the US, Europe, and Japan are already demonstrating prototypes of solar cells that double as roofing shingles to replace the array of solar panels mounted on roofs or in backyards. Those polled at the National Renewable Energy Laboratory point out that Sanyo Electric Co., along with other firms, has been making photovoltaic roof tiles and other shingle-like products since the 1980s. Strong says Energy Conversion Devices of Troy, Michigan, is developing a line of metal photovoltaic products for direct mounting on sloped roofs. One product, he says, uses thin films of amorphous silicon deposited on a stainless-steel substrate "to create a metal roofing panel that is compatible and interchangeable" with standard roofing shingles.

The annual Tour de Sol solar car race, with its science fiction-style automobiles, still attracts media attention, but most of our experts agree that mass-market solar-propelled cars won't be parked in our garages in the foreseeable future. However, those polled think that in 15 years, most cars will use some onboard solar-power generation. Osborn says solar assistance will be "important to long battery life because of the heavy drain of computer and security systems." He also agrees with Goodman, who says that another beneficial use of the technology is providing "auxiliary power for ventilation while a car is parked." Strong thinks photovoltaic sunroof or rear-spoiler collectors may be incorporated in near-future auto designs.

Although Goodman believes a small-scale demonstration of a space-based solar-power generator transmitting energy to Earth could happen 30 years from now, most of our experts agree with Flavin that at a cost of $100,000 per kilogram to put something in orbit, "it will always be cheaper to generate solar power on Earth." Our sources at NREL add that even if the once-popular idea is technologically feasible, it's environmentally risky and would create a single point of failure. "It would be much like routing every Internet node through a single, central office," they say. While a space-based power plan may be an idea whose time has passed, Osborn points out that it was "an important concept because it helped us broaden our thinking about the potentials of solar power."

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WHAT TO LOOK FOR IN A TOSHIBA, COMPAQ AND IBM NOTEBOOK.

See how the screen measures up against the one in a Compaq LTE Elite (10.4"TFT vs. 9.5"TFT).

No sticker shock here. The 910N costs less than the IBM ThinkPad 755C.

On the road, even a few ounces can make a big difference. The 910N is over half a pound lighter than a Compaq LTE Elite.

The lithium ion battery will easily outlast a Toshiba T4850CT by over three hours.

With the SmartPoint trackstick your hands never have to leave the keyboard. Try that with a Toshiba T4850CT external trackball.

Standard memory, you ask? The 910N features 8MB RAM, compared to the 4MB RAM in the IBM ThinkPad 755C.

With all the choices out there, you're probably asking yourself, "What to buy? What to buy? What to buy?"

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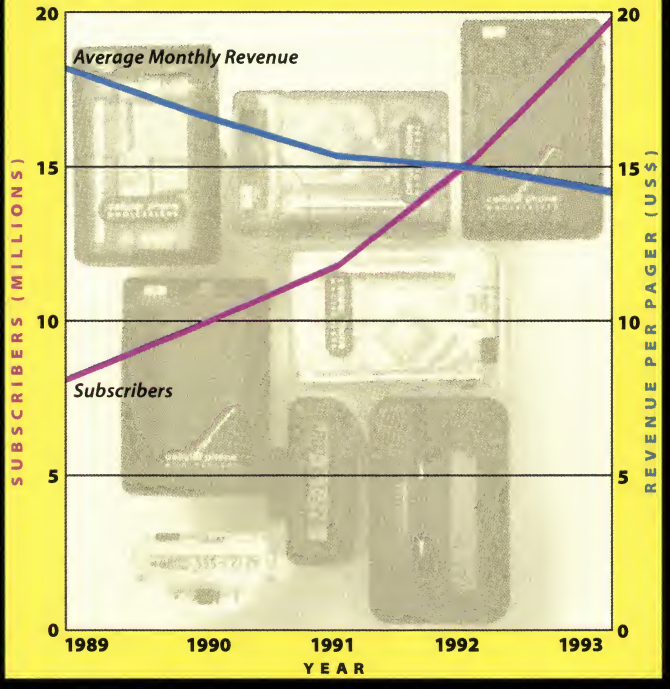
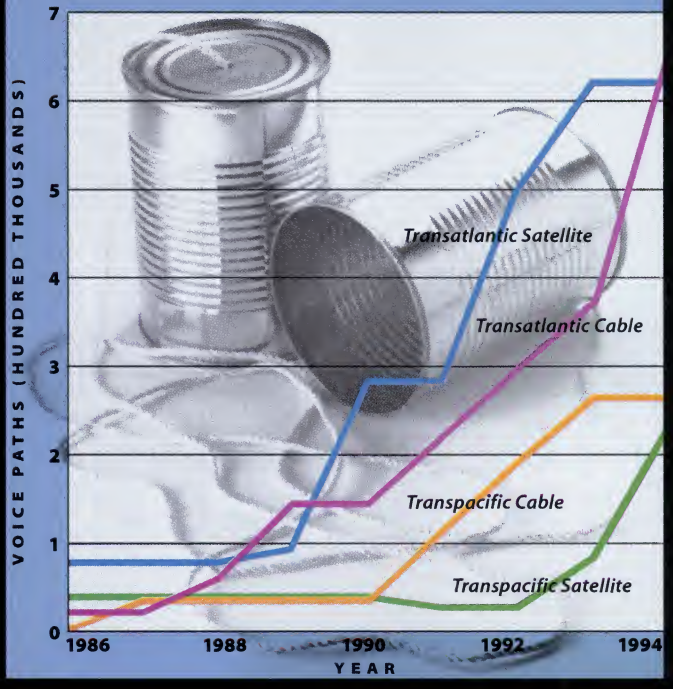
US Pager Market

Falling prices are bringing pagers to the masses. The unfortunate side effect, at least for the pager industry, is a precipitous drop in gross margins. But the industry hopes that service charges for new features, such as acknowledgment paging and data delivery, will push margins back up.



Overseas Telephone Capacity

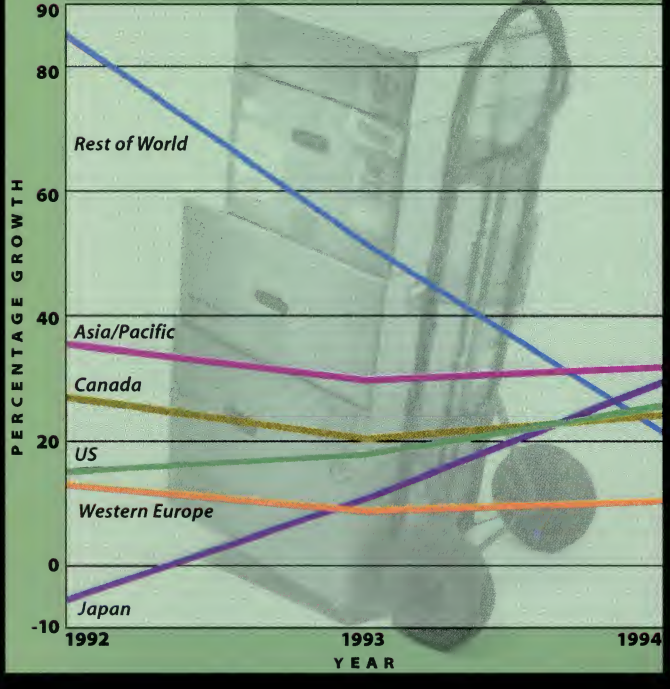
Thanks in part to increasingly effective multiplexing and compression schemes, we've seen a glut of transpacific and transatlantic communications capacity. But this may change because of new applications – like direct video – requiring large bandwidth and low latency.



Edited by Steve G. Steinberg

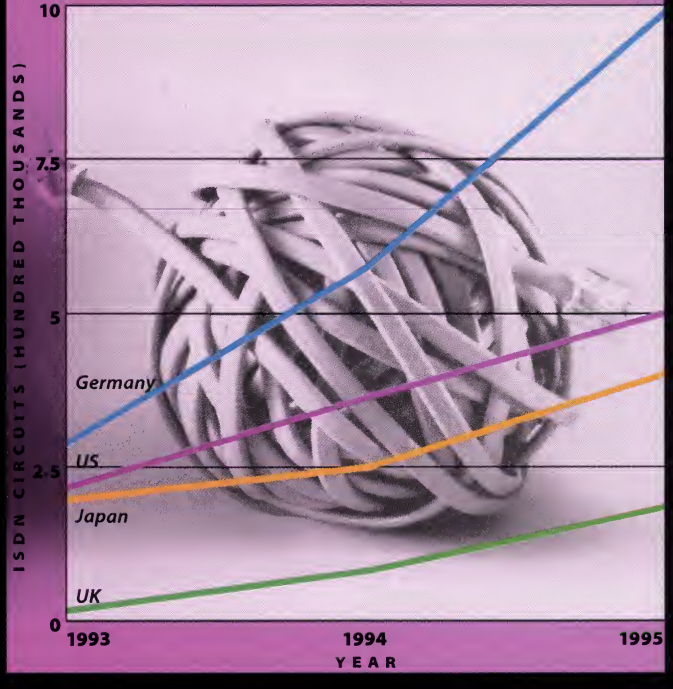
PC Consumption

The United States remains the largest market for PCs. But the greatest growth has been in Asia, and, at least during 1992 and 1993, in Latin America and Eastern Europe. But those latter regions ("rest of world") slowed last year because of political and economic instability.



Installed ISDN Circuits

Basic-rate ISDN service, offering 128-Kbps digital lines to the home or office, is finally gaining acceptance. Germany leads in installed circuits, thanks to aggressive pricing. Eyes are now turning to primary-rate service, which offers a blinding 1,500 Kbps but costs up to US$1,000 a month.



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Wavelet Image Compression

Beating the bandwidth bottleneck.

By Peter Schröder

The military needs to send real-time video to handheld receivers using only a 4800-baud satellite link. Sixteen Gbytes of remote sensing imagery need to be distributed on a single CD-ROM. These are examples of the bandwidth bottleneck that is holding back many multimedia applications. But a previously obscure mathematical tool known as wavelet analysis may eliminate the problem.

According to a growing number of proponents, wavelets allow unprecedented image-compression ratios at landmark speeds; they promise to surpass alternative techniques such as JPEG or fractal compression. However, the technique is only now moving from the mathematics community into industry.

Chui-Wang semi-orthogonal spline wavelet with N=10 vanishing moments

The concept behind image compression is the same no matter what method is used. Any image can be described by listing the color of each pixel. But that's a waste of space. If a group of neighboring pixels are the same color, it is more efficient to use a single description for the region. Take it one step further. What about a group of pixels that are almost the same color? By replacing them with their average, we distort the image only slightly, and the description will be much more compact. This is known as lossy compression and is acceptable for most imaging applications.

What does vary among compression methods is how the regions of similarly colored pixels are detected and described. The technique used by wavelet compression represents an image in terms of special mathematical functions called wavelets. For example, an image that is black on the left and white on the right could be succinctly represented by the mathematical function *color(x,y)=0 if x≤0.5, 1 if x>0.5*. Of course, most images are much more complex, and require more elaborate functions to describe. This is where wavelets come into their own. Because wavelets can be flexibly shaped and molded to describe regions in terms of averages, they are the perfect building blocks to describe an image.

What makes wavelets better than older compression methods such as JPEG is their ability to adapt to the size and location of regions in the image. While JPEG works in terms of eight-by-eight squares, wavelets can describe regions of varying size, shape, and location.

How do we identify the regions that can be coalesced into a single description without significantly distorting the image? By the fast wavelet transform.

The fast wavelet transform takes an image and computes its wavelet coefficients. These numbers, combined with the wavelet function, can later be used to reconstruct the image. The coefficients are computed in different ways depending on the particular wavelet function we want to use. There are many: some smooth, others fractal-like, but they all boil down to fancy versions of averaging and differencing.

With the simplest wavelet, known as the Haar function, we take pairs of neighboring pixels and compute their average and their difference. So, for a row of pixels (14, 8, 4, 6), the averages would be (11, 5) and the differences (6, -2). The averages provide a copy of the original image at half-resolution, the differences provide the wavelet coefficients at that level of resolution. Put the differences aside and continue with the half-resolution image. Again, take averages and differences, put the differences aside, and continue with the yet smaller average image. Eventually, we obtain a single overall average and all the differences – the wavelet coefficients – at the various levels of resolution.

So far, nothing has been compressed. However, when two neighboring pixels have the same value, their difference, and therefore their associated wavelet coefficient, will be zero. There is no need to store this zero. We can also throw away coefficients that are close to zero without significantly distorting the image. We can then encode the remaining coefficients and transmit them along with the overall average value.

On the other end, the image can be reconstructed by performing the inverse of the original transform: we start with the overall average, add in the differences for that level of resolution, and then repeat the process until we have expanded the image back to its original size. Some detail will be lost because of the discarded coefficients, but the important regions – such as object edges, where color differences and coefficients are large – will have been preserved.

Of course, a slightly more complex technique will be used in real-world applications. The wavelet function, for example, will use a much fancier version of averaging and differencing that operates on more than two pixels at a time. But the basic ideas remain the same.

Several considerations are important when selecting a compression algorithm. The most obvious is space saved, and wavelets give consistently better results than other methods. Just as important is the time required for encoding and decoding. While all compression algorithms will perform better if they have more time, wavelets with encoding times only about twice the decoding time achieve superb results. Compare this with fractal compression, which decompresses quickly but requires Herculean effort to compress it. This makes wavelets particularly advantageous for applications such as live video, in which we need to provide compression on the fly.

These advantages are attracting an increasing number of companies that need cutting-edge compression. Magnavox, for example, is incorporating wavelet compression into a number of its video products. The next step will be for this mathematical tool to prove itself in the entrenched world of standards committees. ■ ■ ■

Peter Schröder (ps@math.scarolina.edu), *whose license plate reads "WAVELET," is a postdoc at the University of South Carolina. Wim Sweldens also contributed to this article.*

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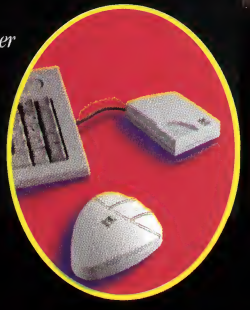

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Selling the Net Short

By Anthony B. Perkins

Netcom will probably cut off my e-mail account for doing this, but I'm going to put in a short order this month for the company's stock. The San Jose-based Internet service provider went public December 15, 1994, at US$13 a share, and its stock has skyrocketed to as high as $31.75. While Netcom has substantially overcome its "busy signal" problem and survived Kevin Mitnick's alleged theft of many of its customers' credit-card numbers, there are several reasons to be skeptical about the company's immediate future.

First, Netcom's Internet browser product, NetCruiser, will become increasingly undifferentiated in a market flooded with browser software. Second, Netcom's ISDN access is weak, which is a significant competitive disadvantage. Finally, a consensus opinion of financial insiders is that once the company founders' stock "lockup" is lifted in June 1995, they will be selling their interests off in a big way, which will undoubtedly drive the share price down.

Speaking of shorting stocks, my decision to short Microsoft last month got a boost when a federal judge struck down the company's antitrust settlement with the Justice Department. In his decision, Judge Stanley Sporkin portrayed the accord as too lenient and said it failed to address certain anti-competitive practices which Microsoft states it will continue to employ in the future. This decision raises the possibility of tougher actions against Microsoft and also casts a huge shadow over the company's announced $1.5 billion acquisition of Intuit, the Palo Alto, California, maker of personal and small-business financial software. This threatens to sink the price of Microsoft stock below $60 a share.

"So, have you invested in any private online companies?" I asked Terry Opdendyk, general partner of Onset Ventures, the Palo Alto- and Austin-based $60 million venture fund. We were sitting under a tent, during a lunch break at Demo 95, David Coursey's hot product retreat in Indian Wells, California, attended by 800 entrepreneurs, investors, and corporate strategy types. By lunch on this, the second day, most of the conference attendees had been swept up in the wave of hysteria over emerging opportunities in the online service business. "We've recently looked at about 30 online deals," Opdendyk said, then paused. "And?" I pried. "Well, we figure that the world doesn't need another browser company, and the Oracles and Sybases will most likely capture the Internet-server software market. So, the only real venture opportunity left is to invest in companies that are creating content and using online technology to distribute and sell it," he explained. I think he's a smart man. As Jeff Berg, chairman and CEO of international talent agency powerhouse ICM, disclosed to me recently, "Interactive content creators are sitting at the front of the value chain."

To me, the hottest private company at Demo 95 was the Cupertino, California-based Architext Software, a start-up that, as of this writing, was run by six recent Stanford grads out of a living room. Architext CEO Joe Kraus and chief scientist Graham Spencer had the audience on the edge of their seats as they presented their revolutionary concept-based "search and retrieval engine" that can give any Internet-accessed or proprietary online service a turbocharge in the text-management department.

The company was first discovered by Robert Cringely, *InfoWorld*'s influential columnist and author of the Silicon Valley satire *Accidental Empires*. He soon had Amanda Hixson, a rising executive in *InfoWorld*'s parent company IDG (International Data Group, a $1 billion trade magazine conglomerate owned by Patrick McGovern) interested in Architext and its ideas. Hixson subsequently hired "the boys" to help work on a secret online project still under wraps. This deal gave Architext the boost it needed to land $500,000 worth of VC money in January from Menlo Park, California-based VCs Kleiner Perkins Caufield & Byers (KPCB) and Institutional Venture Partners (IVP). And, apparently, if they can come up with a decent plan in six months, Architext can expect KPCB and IVP to drop another $1 million into its coffers.

For the Wall Street perspective, I recently had lunch with Lehman Brothers's technology investment bankers Stuart Francis and Mark Dicioccio, whose robust projections for the communications industry bolstered my confidence in the networking company stock picks I made in the TWIT$ portfolio. "We think that up to $250 billion in new equity offerings will be raised over the next five years by telecommunications companies alone," said Francis. This is a huge figure when you consider that Wall Street raised a *total* of $75 billion in equity offerings in 1994. "Driving this growth will be the privatization of many of the international telco companies, such as Deutsche Telecom, and the rapid expansion of services in Third World countries," explained Dicioccio. Both agreed that these huge institutional cash infusions will trickle down to all the telecommunication service and equipment providers. Hence, I feel good about TWIT$ position in Cisco Systems and inspired enough to buy Applied Digital Access Incorporated and ADC Telecommunications. ■ ■ ■

The Wired Interactive Technology Fund (TWIT$)

Company	Primary Business	Symbol	Shares	Price Mar.1	Δ Since Feb.1	Action
Brøderbund Software	CD-ROM sw	BROD	1,100	55	+ 6 ¼	hold
America Online	Online network	AMER	2,800	82 ¼	+ 28 ¼	sell
The 3DO Company	Games hw/sw	THDO	3,000	8 ⅞	- 1 ⅝	hold short
Silicon Graphics Inc.	Multimedia hw	SGI	2,700	35 ½	+ 4 ⅛	hold
Wavefront Technologies Inc.	Multimedia sw	WAVE	5,200	15 ⅞	+ 3 ½	hold
Mobile Telecom. Technologies Corp.	Mobile computing	MTEL	3,300	22 ¼	+ ⅛	hold
Motorola Inc.	Communications/hw	MOT	1,600	58 ⅛	- 2 ⅝	hold
Cisco Systems Inc.	Connectivity	CSCO	2,500	32 15/16	- 1 ⅓	hold
Microsoft Corporation	Software	MSFT	500	63 ¼	+ 4 ⅛	hold short
Apple Computer Inc.	Hw/sw	AAPL	6,000	40	- ⅛	hold
Oracle Systems Corporation	Database sw	ORCL	6,000	31 ¼	- 11 ⅛	hold
New Stocks						
NETCOM Online Comm. Service Inc.	Internet provider	NETC	30,000	27 ½		short
Applied Digital Access	Digital access network	ADAX	4,000	28		buy
ADC Telecommunications	Digital access network	ADCT	4,000	29 ½		buy
Portfolio Value	$1,156,000.00	(+15.60% overall)			4.04%	

Legend: This fund started with US$1 million on December 1, 1994. We are trading on a monthly basis, so profits and losses will be reflected monthly, and profits reinvested in the fund or in new stocks.

Anthony B. Perkins (kids@netcom.com) *is publisher and editor in chief of* The Red Herring, *a monthly investment magazine published in San Francisco.*

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Ziff Happened, All Right

Imagine *Wired*'s surprise upon waking up one June morning last year to find that Ziff Communications Company was for sale. Just a couple months before this shocker hit the headlines, the reclusive Ziff family – Bill Jr. and his sons Dirk, Robert, and Daniel – had relaxed for a nice long chat with *Wired*'s David Armstrong. Funny – despite our leading questions, the word "sale" never crossed their lips....

Though the brothers Ziff vowed to keep their empire intact, no one, it seems, was willing to swallow the whole US$2-3 billion enchilada. In the end, the company was sold in four chunks, garnering the Ziffs in excess of $2 billion. Their publishing company, which will remain under existing Ziff management, was the first to go.

By far the largest piece of the Ziff family business, Ziff-Davis Publishing Company sold for $1.4 billion. Its stable of computer magazines, including *PC Magazine*, *PC Week*, *PC/Computing*, *Computer Shopper*, *MacWeek*, and *MacUser*, was bought by Forstmann Little & Co., a large but low-profile New York-based private investment firm. News of the intended sale broke on October 27, 1994, though the deal wasn't inked until the last days of December. The Ziff-Davis/Disney venture, *Family PC*, and *Computer Life* were also part of the package.

Privately held since 1927, Ziff Communications now faces radical change. According to sources at Ziff-Davis, Teddy Forstmann, 54, announced that he plans to take the company public in three to five years. To keep valuable employees from heading for the hills in the interim, every Ziff-Davis employee enrolled in the profit-sharing plan was immediately vested (a process at Ziff that normally requires seven years' hard labor), and generous holiday bonuses were also doled out.

Ziff-Davis Expositions was off the block next, on October 31. The bill: $202 million, picked up by Tokyo-based software distributor and magazine publisher Softbank Corporation. The company already publishes Japanese versions of *PC Week* and *MacUser*. Ziff-Davis's Information Access Company, which provides electronic indexes, abstracts, and information from trade and industry publications, went on December 8, to Canadian media concern Thomson Corporation, for a whopping $465 million.

But industry watchers were most interested in who would buy Interchange Network Company L.P., developer of Interchange Online Network. Cambridge, Massachusetts-based Interchange was Ziff's pricey (and, at this writing, not-yet-launched) online service, specifically designed for electronic publishing.

Three days before Christmas, AT&T announced that it would purchase Interchange for more than $50 million – a deal when you consider that Ziff had already invested tens of millions to develop and test the service. It was made an even better deal by the subsequent announcement that TCI was investing in the Microsoft Network at an implicit valuation of over $600 million.

Throughout the past six months, the firmly retired Bill Jr. has publicly stood behind his sons' decision to sell the family business. – *Janice Maloney*

[ORIGINAL STORY IN *WIRED* 2.05, PAGE 86.]

Blame the Consumer

Last March, Performance Systems International (PSI) and Continental Cable Vision announced Internet access delivered over the TV cable system. Would-be customers in Cambridge, Massachusetts, were promised data rates of 500 Kbits per second for US$125 a month. More than a year has passed, and the service has yet to get off the ground. One problem, says Jeffrey Shapard, PSI's cable product manager, is Continental's television cable. "Some segments are cleaner than other segments. When we run data communications over it, we have to tune. We have the individual service in beta."

Meanwhile, Cambridge residents will have to keep waiting. For how long? Nobody's sure. "We stopped saying dates. Every time we say a date, we get burned."

[ORIGINAL STORY IN *WIRED* 2.05, PAGE 28.]

The Zillionaire Fumbles (Again)

Seems Paul Allen's flagship company, Asymetrix, is acting true to form. After recent, massive layoffs (more than 89 people were let go, and many have handed in resignations), Jesse Berst, an editor at *Windows Watcher* newsletter, told the *Wall Street Journal* on January 17, "[Asymetrix] had a great mind-share lead and squandered it."

Though its bylaws call for yearly meetings, the 10-year-old Asymetrix called its first shareholders meeting on March 15, 1995. At press time, it was rumored that current employees will have their stock reissued: those who are vested will no longer be, and will possess shares at a lowered stock valuation. This will disenfranchise all former employees, including those who developed the products on which Asymetrix turns a profit. If this plan goes down, it will be the second time Asymetrix has revalued its stock.

Company spokesmodel Vern Raburn contended that Asymetrix had been spending too much capital on R&D. But informed sources speculate that the company probably hasn't spent much money on pure-form R&D since 1989 – the last time it had a major layoff. Raburn, eerily recalling statements made by industry analysts after the '89 layoffs, was quoted in a January 25,1995, *Seattle Times* article as saying, "It's time to start making money on some of the investments we've made, so there's more of an emphasis on making money than there was at Asymetrix four or five years ago."

[ORIGINAL STORY IN *WIRED* 2.08, PAGE 94.]

Internet Flames Scorch West

As part of the Republicans' new "Contract with America," the House of Representatives put forth legislation called the "Paperwork Reduction Act." This bill, introduced on February 6, 1995, contained a provision, widely believed to have been inserted for West Publishing, that would have limited the government's right to disseminate or provide public access to databases. But on February 10, flames from Net users put the kabosh on West's plans, and the provision was struck from the bill. More details next month.

[ORIGINAL STORY IN *WIRED* 2.05, PAGE 98.]

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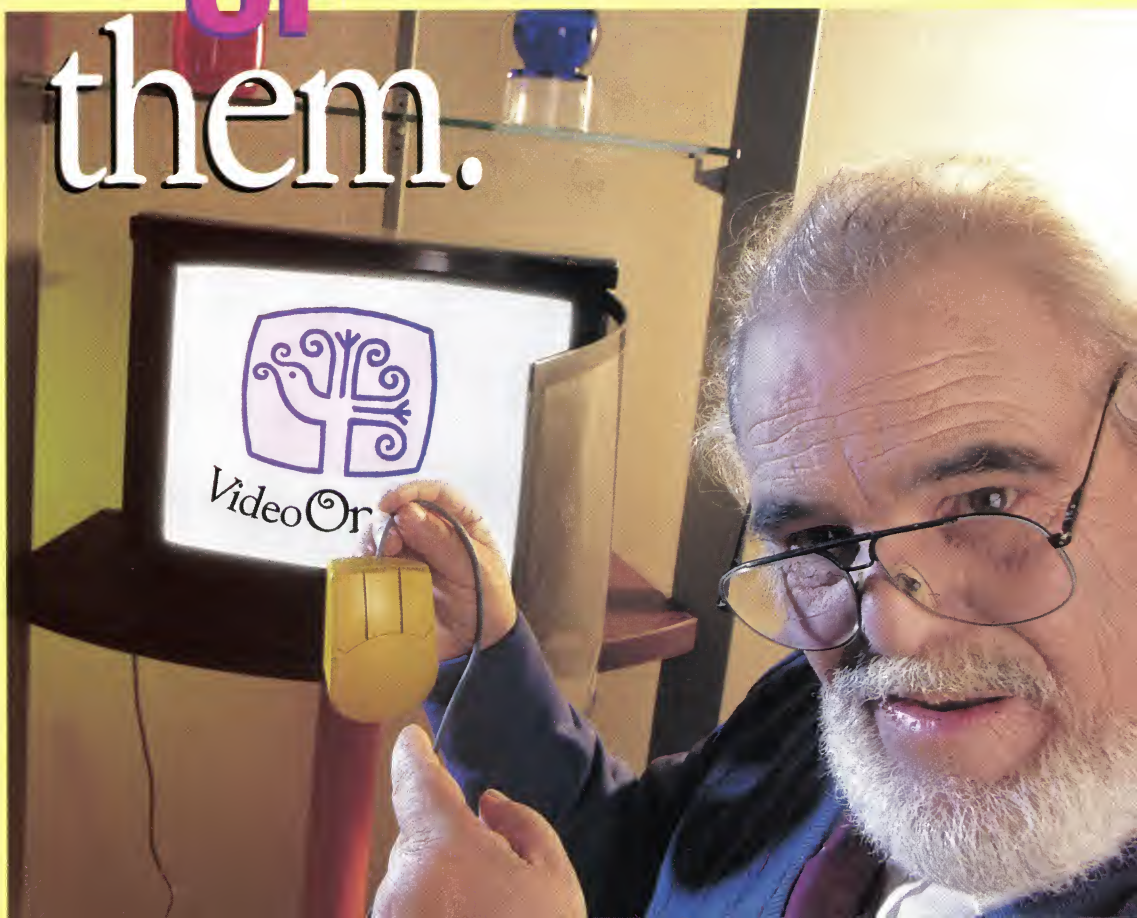

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Can Pyromaniacs Fight Fires?

The president has convened an interagency "Privacy Working Group." Are your rights more – or less – secure when it's in session?

By Peter Cassidy

You knew the Clinton administration was, let's say, naïve for biting down so hard on the National Security Agency's line on the Clipper Chip. But you gave it the benefit of the doubt, assuming the cybercrats were well-intentioned if misled.

Those press photos of Vice President Gore merrily splacking away in CompuServe conferences assured you that the most informed, dedicated, and conscientious minds in government would make coherent sense of the mad, rushing convergence of digital media.

But there are agents in every government who will work toward their own gain. Some from this government have apparently converged on the working committees of the Clinton administration's Information Infrastructure Task Force, a group established by the White House in 1993 to sculpt the vision of the administration's National Information Infrastructure.

In the case of the task force's Privacy Working Group subcommittee, a disturbing number – about a quarter of the members – have a highly ambiguous posture regarding privacy: their careers are based on creative invasion of it.

Included in this subcommittee, which began its weekly meetings in August 1993, are representatives of the NSA (an international spy agency), the IRS (a domestic spy agency that monitors Americans' personal finances), and the Justice and Treasury Departments, both outfits with legacies of abusing taxpayer privacy.

Can these characters really be entrusted with policy questions on personal privacy? Let's examine the members' professional perspectives. NSA's fiscal 1995 budget, according to a report published by *Defense Week* last summer, is US$3.5 billion, much of it dedicated to listening to the world's electronic communications. The three NSA guys could be communications security consultants (though this may conflict with the Computer Security Act, which mandates that civilian networks are to be secured by the Commerce Department's technical advisors). But remember, the NSA was the outfit ordered to halt its domestic surveillance program, Operation Shamrock, by the Senate's Church committee, which was appointed to investigate CIA abuses in the mid-'70s. And the NSA also developed the Clipper Chip, the world's first encryption system built with a spare key for easy government surveillance.

The Internal Revenue Service? In December, the IRS proposed an amendment, now in effect, to the Privacy Act "system of records" that could lead to the instant creation of dossiers on all Americans. It would draw from virtually every database extant – from local land registries, motor-vehicle registries, and credit bureaus. This proposal is even more invasive than the National Data Center proposal that was rejected by Congress in 1966 as an invitation to tyranny. It's not a program that would be dreamed up by privacy zealots. After Knight-Ridder papers ran an item about the new IRS proposal, the IRS backed off with a "clarification" that the upgraded system will not be used to identify individuals, only group trends.

Department of Justice? Yes, these guys are bound by rules of procedure. But if a change in regulation can place something into view – where it's available without a warrant – why not? The FBI is always pushing the envelope, lobbying for amendments to give its agents access to financial information through "administrative subpoenas," for instance, instead of a warrant. This is not a crowd of privacy absolutists, to be sure.

Treasury? True, a body of regulations ensures bank confidentiality, but one of the Treasury's reps on the panel is Stephen Kroll, chief counsel for the Financial Crimes Enforcement Network. The outfit uses high-order artificial-intelligence computer hardware to sift through federal and local databases to track down money launderers – and to target new subjects for investigation. I'm sure *Kroll* will never be accused of privacy fanaticism.

The United States Postal Service? The USPS rep on the panel is Chuck Chamberlain, the unlucky fellow who addressed a smart-card conference in Virginia last spring, discussing the logistics of delivering 100 million national "privacy" cards, which to privacy advocates sounded a lot like a national identification system. Chuck later got yelled at for spilling the beans, though the cards were part of Clinton's own reengineering-government and health-care plans. As a White House technology policy advisor said, "Chuck, he got a good talking to."

Given the market's answers to privacy on the public networks – onetime password schemes, encryption – what could be the motivation for packing the Privacy Working Group with characters whose stock-in-trade is privacy invasion?

The administration's history indicates that these soldiers of twilight information wars are on the panel to defend their agendas. After all, the Clinton White House embraced Clipper in 1993 as if it were a warm puppy, and got behind the FBI on the Digital Telephony Bill in 1994. That bill gives the Attorney General wide powers in controlling the design of the public phone network to maximize law enforcement's power to tap lines when and where it pleases.

If you'd like to know whether you can sit in on these Privacy Working Group meetings, ask Mike Nelson at the White House (*mnelson @ostp .eop.gov*) when the next panel adjourns. Or do some investigating of your own at the Information Infrastructure Task Force's Web site: *http://iitf.doc.gov/*. ■ ■ ■

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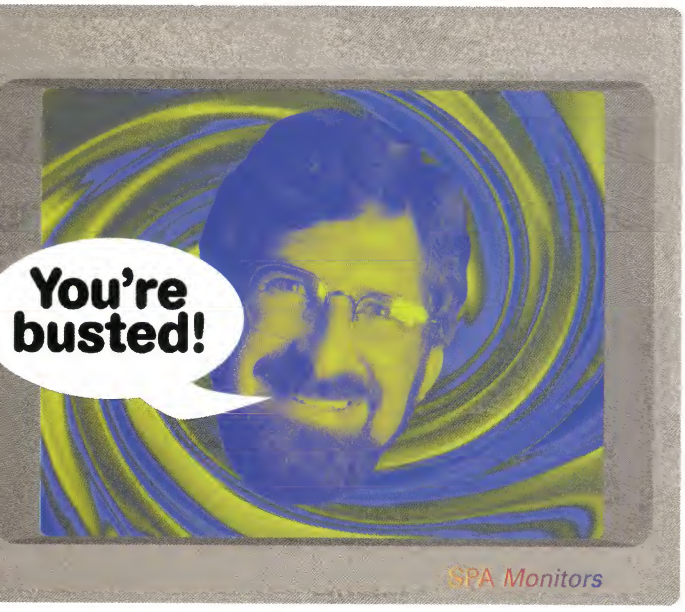
The Software Police

They hear from the snitch you copied that disk, they send in the marshals to bust your ass. No joke.

By Bronwyn Fryer

An old, baggy-eyed, Einstein-haired Frenchman, wearing a white lab coat and orange polyester pants, sits typing at a desk. He peers up to see a chic, statuesque woman in her late 20s, wearing a fringed black miniskirt, who materializes, as if in a dream, before him. "*Salut*," she says softly, her red lips mouthing the words, ever so slightly out of sync. Meanwhile, the eye of the camera travels over her neck, pans down the curve of her shoulder, along the slope of her belted waist, and rests on a fringed hip. Then she thrusts her hands into the old man's coat, slowly unbuttoning his shirt. "*Je peux ... rendre service chez vous ou dans le bureau*," ("I can service you at your house or at the office") she willfully promises.



Ken Wasch is leading up the SPA's fight against software piracy, but he's feeling the heat from a strong international competitor: the BSA.

My Gawd, I'm thinking, I've seen a lot of bad corporate propaganda videos in my time, but this thing is so bad it's almost good. It's more French than French, more allegorical than Aesop. The story is simple: the woman, representing the Whore of Illegally Copied Software, tries without success to seduce the old man into putting her on his hard drive.

Eventually, realizing that she cannot succeed, she asks what she can do to work legally. He hands her a card bearing the number of the Software Publishers Association. "They can help you," he sighs. On the video cover, the title *La Pirate* looms over a cartoon of two men in an office, one of whom is passing a floppy disk to another. The cover doesn't give any hint of the cavorting that is depicted on the magnetic tape within. The back cover, translated, reads: "The Software Publishers Association Europe is a European professional association promoting the interests of microcomputer software publishers."

My French friend Dominique had tipped me off to this videotape. Though I knew that the Washington, DC-based Software Publishers Association produced "educational videos," I was especially interested in this one, specifically made for the European market.

As it turns out, producing "educational" videos like *La Pirate* takes up only a fraction of the SPA's activities. The 49-employee, 1,150-member trade association is a veritable octopus, whose tentacles extend into practically every arena of the PC software industry. Its members (from Microsoft to Joe's Shareware and just about everyone in between) pay SPA anywhere from US$700 to $100,000 in annual dues, depending on the company's software sales.

In return, the SPA publishes market data and lobbies Washington on behalf of the software industry when it comes to GATT or such encryption technology as the Clipper Chip. It also publishes a member newsletter, sponsors three annual conferences, and holds its Excellence in Software Awards ceremony each March.

But the work for which the SPA is most famous is that of fighting software piracy. And piracy is big business: the SPA estimates that revenue lost to software piracy in the US during 1993 was $1.57 billion. For years, the SPA has played the software-industry's hired Batman to corporate MISers' evil Joker. Prior to 1992, the Software Publishers Association busted some 200 companies – including such software publishers as Platinum Software of Irvine, California (which was forced to pay $89,000 in damages), or Health Line Systems of San Diego (it paid $17,500).

Yet the SPA isn't exactly the beloved, do-gooder organization it bills itself as. The association takes the bulk of the money it makes from software raids and pours it back into its own anti-piracy fund, rather than returning it to the software manufacturers whose products were supposedly ripped off in the first place. And its executive director, an outspoken, tough, and litigious lawyer named Ken Wasch, apparently has the entire industry cowed.

What's more, the SPA is now under siege within its own domain: fighting software piracy. Three years ago, a group of the SPA's largest members – Microsoft, Lotus, WordPerfect, Aldus, and Autodesk – dissatisfied with what they saw as the SPA's ineffectiveness, pulled their anti-piracy efforts from the hands of the SPA and passed it to another Washington, DC-based anti-piracy group, the Business Software Alliance.

Many vendors who've moved their piracy-fighting efforts to the BSA still maintain membership in SPA for other benefits the organization offers. And to be sure, the SPA still remains the most well-known anti-piracy organization in the US. But it has been losing ground internationally to the BSA; and as is the case with most turf wars, the SPA-BSA struggle centers on power, influence, and, most of all, money. The SPA's annual report claims that "nearly 80 percent of the industry's piracy losses occur

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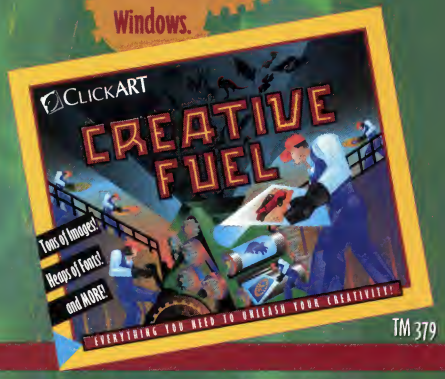

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outside our borders"; these billions in lost revenue are the prize that the SPA and the BSA are tussling over.

Stopping piracy isn't simple. Rather than track and catch pirates themselves, SPA members turn over limited power of attorney to the SPA to do audits against organizations suspected of illegally using their software. Whether or not to bring suit against companies suspected of pirating software is the SPA's decision, which it makes on a case-by-case basis. (The SPA tends not to go after individuals.) The organization's anti-piracy arm, headed up by one lawyer and a support staff, operates much like a prosecutor's office or a specialized law firm. A bust works like this: a snitch – most typically, according to SPA litigation manager Peter Beruk, a "disgruntled employee" wanting to wreak vengeance on a current or former employer – calls an 800-number hot line to report illegal copying of software. After conducting an investigation and concluding that action should be taken, the SPA either sends a cease-and-desist letter to the company, requests an audit (reminiscent of an IRS audit – the company has to prove that it bought and paid for every piece of software), or sues. In 5 percent of cases – those in which, according to the SPA, it's "obvious that the law is being deliberately ignored" – the SPA raids the company to catch the bad guys red-handed. After a federal district court issues an order, a tactical team of federal marshals carries out the raid, working in conjunction with the SPA's in-house staff and consulting attorneys. One-fifth of the SPA's employees work on anti-piracy activities.

Getting slapped by the SPA is one of the worst things that can happen to a company. Under the law, the SPA can force the busted company to pony up as much as $100,000 for each copyright infringement (i.e., per product, not per copy), plus legal fees. Aside from having to pay damages, or at least cover the cost of the software, raided companies also undergo the equivalent of an old-fashioned tar-and-feathering; the SPA uses publicity to humiliate companies. While the association keeps its audits confidential, Beruk points out, it issues press releases on actual raids.

According to Jeff Tarter, editor of the industry newsletter Soft•Letter and an outspoken critic of the organization, the SPA started out as a run-of-the-mill trade organization. But, Tarter says, Wasch saw lucrative potential in policing software pirates and the organization started hitting real pay dirt during the mid-1980s. "Wasch saw an emotional issue that the organization could make money on," Tarter asserts. "Today, the anti-piracy stuff underwrites a large part of the operations of the SPA. It's the single most profitable thing they do. Now they come out of every raid with a sackful of money. They turned piracy into a cash cow."

Indeed, playing software cop for the industry's members ain't a bad living, especially for a nonprofit. In 1993, SPA's anti-piracy efforts pulled in $3.6 million in litigation settlements. The money from litigation goes right back into its own coffers to fund the anti-piracy campaign (including the making of films like *La Pirate* and pricey, glossy press kits). As director, Wasch oversees the SPA organization; he even wrote part of the script of *It's Just Not Worth the Risk*, a propaganda video that's part poorly acted anti-piracy diatribe and part bad *L.A. Law* episode. About 40,000 free copies have been distributed to corporate MIS types. "There are more copies of that out than there will ever be of *Wyatt Earp*," Wasch laughs.

Getting slapped by the SPA can be disastrous. Under the law, a busted company may have to pony up as much as $100,000 per product copied — plus legal fees.

In hot water

I thought it might be instructive to see what a software bust was like, so I asked Beruk if I could go along for a ride. But for legal reasons the press is barred from raids. And, as it turns out, the SPA is conducting a lot fewer raids these days – in part, boast the SPA folks, because the organization has done such a good job of educating the public, and in part because cease-and-desist letters and audits are threatening enough.

Since firsthand experience of a raid was not in the cards, I tried instead to talk with companies that had been busted. I contacted two dozen companies whose names had either been given to me by the SPA, or whose names I pulled from press clippings. The SPA's "bullying" campaign – as Will Zach-

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mann, president of Canopus Research in Duxbury, Massachusetts, calls it – has proved marvelously effective. Almost no one returned my calls; of those who did respond, all but one declined my request for an interview, even when promised anonymity.

One information-systems director with whom I finagled a brief conversation had a tremor in his voice when recalling the SPA bust. He said he might share his opinions about the experience but would have to get permission to talk to me. A few days later, I received a terse call from the company's corporate communications specialist "declining further interviews." I suppose they had endured enough public humiliation, thanks to press releases put out by the SPA and articles that appeared after the investigations.

"It was worse than getting audited by the IRS," says David Heide, who worked at Snap-on Tools when it was raided. "At least the IRS sends a letter of notice that it's coming."

After dozens of phone calls, I finally managed to speak to the president of one mid-size West Coast manufacturing company who requested that he not be identified. He said when his firm was found guilty of using illegal software after a raid in 1989, it wanted to hush up the whole thing as quickly as possible. "We just worked out some deal, and paid a five-digit figure to get our general absolution," he recalls. What about the raid itself? "It was – uh – a startling event," he recalled. "There was no warning. A group of 10 people in Brooks Brothers suits just showed up one day with a court order. They spent about two hours checking PCs and looking for manuals and then left." In retrospect, he wishes that his company had received a warning in the form of a cease-and-desist letter, or a demand for a software audit. "A cease-and-desist order would certainly have been more civilized," he sighs.

Nor were warnings in store for Snap-on Tools (now Snap-on Inc.) of Kenosha, Wisconsin – the only case the SPA has been forced to drop. After a tip from a former employee, SPA auditors and federal marshals showed up at the guard house of Snap-on with a warrant to search for illegal software.

The marshals spent three days searching 300 PCs for illegal software, moving from desk to desk to search hard disks. "It was worse than getting audited by the IRS," says David Heide, a public relations manager who was present at the time of the raid. "At least the IRS sends a letter of notice that it's coming," he adds. Snap-on spent days afterward documenting all the software, ultimately proving that everything was paid for.

Despite being exonerated by both the SPA and the Feds, the raid on Snap-on took its toll. The worst part of the experience, according to Heide, was the scarlet-letter effect. As a large employer in a small town, the notoriety damaged the firm's public image. "The effect is what you might expect," he recalls. "The SPA had never lost a case, and the common presumption was that if you were raided you were as good as guilty. People were nervous, and suddenly insecure about us as an employer. There was a lot of negative feeling built into the action. The onus is on you to prove that you're honest."

Although Snap-on had a basis for a lawsuit on the grounds of lost productivity and disruption of deadlines, according to an article in the local Wisconsin paper, the company didn't retaliate. "We didn't like the SPA's tactics, but we're sympathetic to the software industry," says Heide. "We don't want to be in the vanguard of attacking the industry trade organization." The only thing that really mattered was a correction to the public record, which was effected in the form of a press release put out by the SPA, patting Snap-on on the back for being a model company.

How could the SPA have gone in to Snap-on without having its ducks in a row? "That was the only time we ever made a mistake," says Beruk. "We felt we had solid information from someone who was in the position to know. It was a gamble we took. By the time we got authority to bring the suit, they got clean. I suspect they were tipped off."

Told of this allegation, Heide waxed furious. "I've never heard of anything so ridiculous in my life," he retorted. "I'm surprised the SPA would say that, after all their help and cooperation with the press release retracting the action."

Turf wars

Five blocks from the SPA's headquarters, the 16-employee Business Software Alliance pretty much walks the same public-policy and

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anti-piracy walk and talks the same talk. With similar press kits full of similarly huge numbers about loss of revenues because of software piracy, the only obvious difference between the two organizations is that the SPA is larger, both in number of members and employees, and more diverse in its activities. Both organizations put the money they gain from litigation back into their own coffers, using it to fund anti-piracy efforts in the form of surprise raids and audits. Indeed, agrees BSA President Robert Holleyman, a former public-policy lawyer, "We have similar policies in place in terms of how we handle enforcement actions."

I'd never heard of the BSA, but chances are if I'd lived outside the US, I would have. During the 1980s, while the SPA was battling software pirates on the domestic front, it was paying less attention to the international side, where most piracy takes place. In the interest of pursuing international software piracy – and, perhaps smelling a lucrative opportunity to sell more software licenses abroad – five software vendors (Aldus, Autodesk, Lotus, Microsoft, and WordPerfect) banded together in 1988 as "a global alternative to the Software Publishers Association," according to one BSA member.

Unlike the SPA, a comparatively easy-to-join organization open to just about everyone, the BSA is more like an exclusive big-boys club for software giants like Microsoft and Lotus.

But unlike the SPA, a comparatively easy-to-join organization open to just about every programmer with a dream, the BSA is more like an exclusive big-boys club for software giants like Microsoft and Lotus. The cost to join? "Prohibitive," says BSA spokesperson Diane Smiroldo (who, when pressed further, would say only that cost "varies").

There's no love lost between the BSA and the SPA. Wasch claimed that Microsoft pays more than $3 million annually to the BSA, while its yearly dues to the SPA are $100,000. "You can buy a lot of influence for that kind of money," he says. Microsoft declined to comment on its BSA membership, but Lotus Development Corp.'s general counsel Tom Lemberg says simply, "We've found it easier to work with the BSA. We were better off creating our own organization."

The BSA is enjoying ascendancy on Capitol Hill, thanks to power and talent in all the right places. The organization has worked closely with Senator Patty Murray (D-Washington) to try to ease export controls on software with encryption capabilities, and with Senator Orrin Hatch (R-Utah) on international copyright issues. And the BSA has also developed an international anti-piracy organization: rather than taking the American-centric approach adopted by the SPA, BSA worked with foreign governments, software distributors, and others to set up regional sub-organizations.

BSA members who asked not to be named said that splitting anti-piracy efforts into two sides – the SPA acting as domestic software police, and the BSA doing the international crime-fighting – "worked well until around 1992." That was when the SPA began to sense that it had left its international anti-piracy market wide open to a competitor. "The BSA was in 55 countries and was doing a great job handling anti-piracy on a local basis," said a representative from a BSA member company that maintains ties to the SPA. "Then the SPA started going into these countries, wanting to establish anti-piracy efforts there, too. The larger publishers all thought, Why are we funding our own headache?"

Opting for more control over their own public-policy and anti-piracy operations, the five software publishers that formed the BSA withdrew their support for the SPA's international and domestic litigation program in July of 1992, forbidding the SPA to litigate against anyone, anywhere, on their behalf, though they remained members of the organization.

Meanwhile, the SPA chased the BSA into the international market, stepping up enforcement activities in individual countries and producing $20,000 videos like *La Pirate*. The BSA claims that its 1993 worldwide settlements exceeded $5 million. Since it began its North American program in 1992, it has settled 400 cases, one of the largest of which totaled $260,000.

Estimates by both the BSA and the SPA put the numbers for international piracy well in the billions. BSA estimates that 94 percent of the software in Poland, 98 percent in Kuwait, and 99 percent in Indonesia is pirated. The SPA places the grand total of loss in revenue

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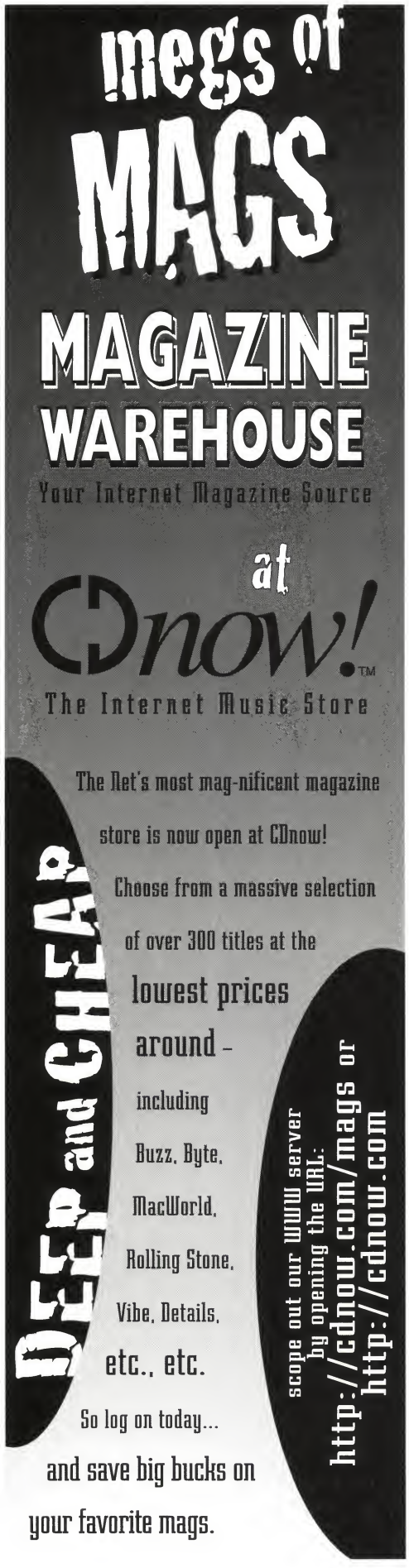


at $7.5 billion – an amount almost equal to that of 1993 revenues from legal PC business-application software sales.

Though BSA's Holleyman argues that fighting software piracy in some countries is a financial "black hole," he also confirms that fighting piracy in the US where laws are stronger is now "profitable."

Clearly, Wasch is not about to leave the enormous international anti-piracy market in the hands of the BSA. "There's no secret to what this is all about," he says with the kind of directness that one can't help but admire. "It's about money."

The lawyer joke

In researching this article, I spoke with dozens of people – not only information-systems managers, but also representatives of SPA-member companies and former SPA employees – who were clearly too frightened of Wasch to go on record discussing him. SPA members and outside observers who asked not to be identified repeatedly referred to Wasch as "greedy," "inflexible," "aggressive," "single-minded," and "dictatorial," even applying canine terms ranging from "terrier-like" to "pit bull." (Fearing what he described to me as "character assassination," Wasch contacted the legal counsel of one large vendor company to try to flush out my sources.) As irritating as Wasch's intimidating calls and continual interrogation may have been to me, when compared with the buttoned-down, well-handled, be-cooperative-but-say-little approach that BSA president Robert Holleyman politely offered, Wasch's stubborn in-your-faceness was almost refreshing. And, after all, the complaints about Wasch could also serve as compliments: If you were a software vendor and you felt you'd been ripped off, wouldn't you want *your* lawyer to be a bit "terrier-like"?

Still, the fact remains that weird videos like *La Pirate* and fiascoes like Snap-on don't do much to help the SPA's reputation. And Wasch has also lined up a slew of powerful critics, including industry influencers like Soft•Letter publisher Tarter. Some of Wasch's critics sit in high places, and would like to see him retire his black cape. But Wasch, fresh from his eleventh reelection in a row by a board of directors who firmly believe in his abilities, is predictably defiant. "This is a political job. So what would happen if I left?" he snorts. "The board would find someone just like me to take my place."

To hear Wasch tell it, the whole turf war with the BSA is about the Big Software Companies trying to dictate the rules of the anti-piracy game to the Little Guys, the game companies and others that make up the vast majority of the SPA's membership.

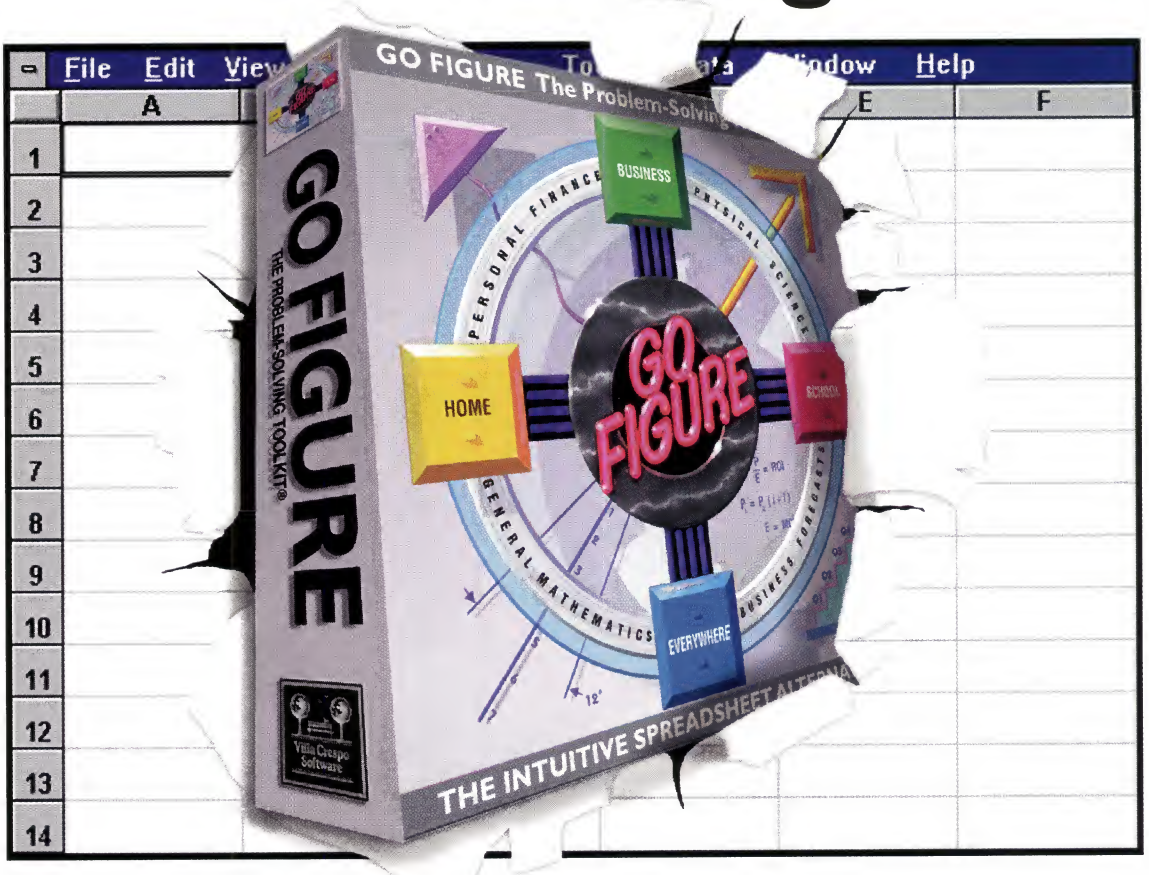
One of the "little guys" is my friend George Campbell, a white-bearded, gentle, hacker-writer guy who runs a shareware company called OsoSoft in Los Osos, a small town near San Luis Obispo, California. Campbell told me that he paid the $700 membership to the SPA "so I could put its logo on my stuff," but adds that it gets him the organization's marketing information and conferences, too. He also says that the SPA stuck up for shareware authors when they needed it. "When the videogame companies were getting their software rated, we wanted to have shareware rated, too," he notes. "But the $500 cost for rating was too prohibitive. The SPA went to bat for us, so they got the price of the rating knocked down to $25. That was positive."

The SPA is now chasing the BSA into international markets. "There's no secret what this is all about," explains Wasch with a directness one can't help but admire. "It's about money."

While the SPA may have made its mistakes – spreading itself thin among too many members with different interests, barking up the wrong tree with Snap-on, or retaining a president with a pit bull reputation – the BSA appears to be a closed, élitist organization. I concluded that they were more or less two sides of the same coin, and that the only thing that really separates them from each other is the color of their press kits. Ultimately, they seem to be two competing DC law firms, whose partners pass each other in the street. They smile while preparing to run over anyone who stands in their way to win the case. It's like that old lawyer joke: "How many lawyers does it take to screw in a light bulb?" The answer: "Two. One to screw in the bulb and the other to kick the ladder out from underneath." ■ ■ ■

Bronwyn Fryer is a business and technology writer based in Boulder Creek, California.

Breakthrough.



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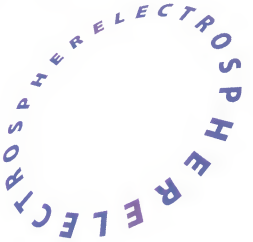
The Next Best Thing to Being There

Forget 900 numbers. Virtual Connections has come up with the latest in adult entertainment: personalized video sex.



By Robert Rossney

On a busy night, Brandi may do 20 shows. She flirts with her customers. She teases them with racy talk. She lets them peek down her top. As the show goes on, she moves around a bit, performing a bump and grind and bending over lasciviously. Eventually, once her customer is on the hook for enough money, she strips down to nothing. Like the talk-to-a-live-nude-girl booths, this is hardly the most glamorous or dignified line of work anybody ever heard of.

If you ask nicely, she'll show you what's under that dress – but it'll cost you four bucks a minute.

But Brandi has a definite advantage over the typical peep-show employee. If her client gets out of line, she can just hang up on him. When she does, the window on the screen of his computer will close, and her slow-scan video image will be gone. All that will remain is the memory – and, in the program's scroll-back buffer, the remnants of the sweet nothings they've typed to one another.

The phones at Virtual Connections Ltd. never seem to stop ringing, and everybody who calls wants to know the same thing. Is this for real? Does it really work?

This drives Tom Nyiri crazy. *Yes*, it's for real, he says. *Yes*, it really works. Nyiri, who founded Virtual Connections with his partner Rod Roz-on, seems surprised that anyone would doubt this.

Nyiri and Roz-on are unlikely adult-entertainment impresarios. They both look like, well, programmers. Tom, who is tall, blond, and cheerful, could be an overworked systems analyst in a bank. And Rod, who is gaunt and dark-haired, has Jolt Cola-addict written all over him. Right now, he looks older than Tom, though at 23, Rod's nine years younger.

They're both a little on edge. The two have been putting in 120-hour weeks on this project since November. They've had to deal with cranky hardware, flaky models, unexpected office improvements, the vice squad, and a flash flood that totaled Rod's car and ruined the carpeting. Making the technology work is a problem they solved so long ago they barely remember doing it.

It works, and it doesn't require much in the way of exotic equipment. If you want to hook up with Brandi, you need a fairly fast PC, a 9600-baud modem, and a graphics card that supports 256 colors. Your computer needs to be running Windows, and you need Virtual Connections's communications software. You also need some time alone between 2 p.m. and midnight, when the models are on the job.

With all of that, you can dial in for a session with Brandi. You can watch her cavort on your screen at two frames per second inside the traditional teeny box of desktop video. Type in a flirtation or two and she'll type back.

And yes, if you ask nicely, she'll show you what's under that dress – but it will cost you four bucks a minute.

This is an alarming price structure if you let the computers and modems fool you into thinking of Virtual Connections as an online service. Even Lexis doesn't cost US$240 an hour. But the price is competitive if you consider Virtual Connections part of a different industry, one the phone companies like to call adult information services but the rest of us know as phone sex.

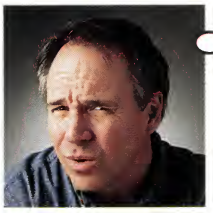
As phone-sex services go, Virtual Connections is a bargain. Services charging $3.98 a minute for dirty talk are commonplace, and they don't have pictures.

They're beyond commonplace. They're ubiquitous. There's a reason: phone sex makes a lot of money, and it's an easy business to get into once you have the resources lined up. You need a phone switch, a voicemail system, billing software, a stable of work-at-home contractors, and ads in every alternative newspaper and men's magazine you can find. It isn't simple, but it isn't fabricating semiconductors either.

The typical phone-sex start-up is a perfect example of the virtual corporation. There's no office, just a voicemail system in someone's closet. There are no employees, only independent contractors. As an organization, it's lean, flat, and flexible – flexible enough so that if the taste of the market changes, the business can vanish completely and reappear a month later with a new name and a new look – everything changed except the phone number. Reengineering the corporation is not much harder than changing the outgoing message.

GLENN BAIR

INTERNET?



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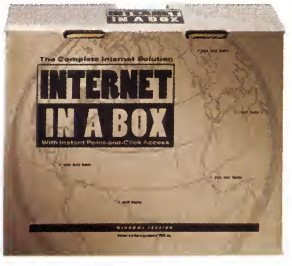

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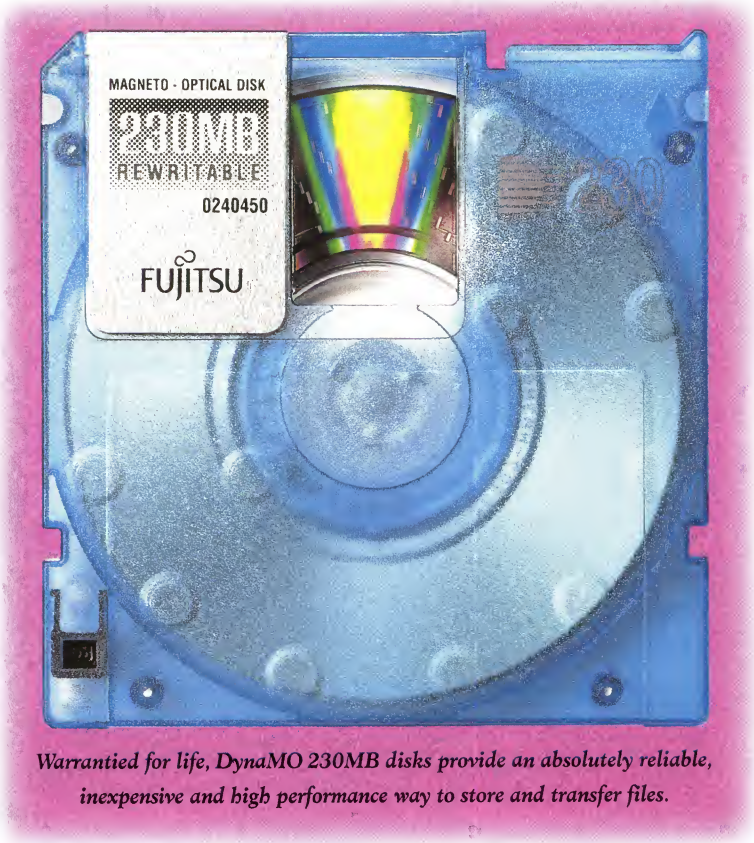

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When you start up a phone-sex business, you don't have to worry about OSHA, the State Board of Equalization, employer mandates, or anybody's pension plan except your own.

When you start up a phone-sex business, you don't have to worry about OSHA, the State Board of Equalization, employer mandates, or anybody's pension plan except your own. And since you can pull up roots in no time flat, you don't need to worry too much about local community standards.

Virtual Connections is not a typical phone-sex business. It can't be. Because if there's one thing this office is not, it's virtual.

The shop is in a shabby but strangely cheery complex in Sorrento Valley, a part of town often called San Diego's answer to Silicon Valley. Places like this, on the edge of the edge city, are the cheap seats of American enterprise. They're where small manufacturers get their start and new professionals first hang out their shingles. With a consulting scientist, several photographers, and a maker of snowboarding equipment for neighbors, Virtual Connections is in the right place.

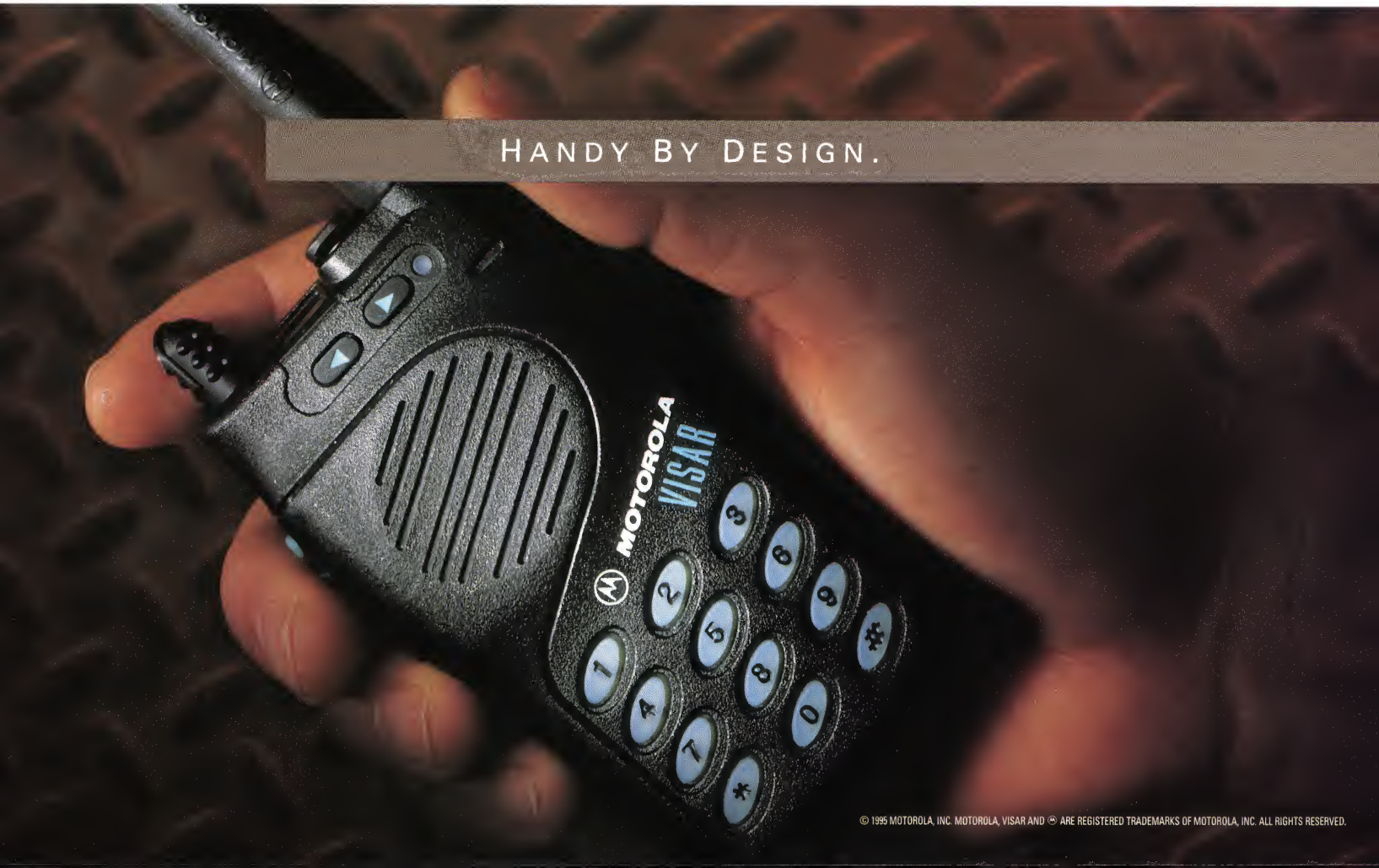
For the most part, the office looks typical of small software start-ups. It has the whiteboards, the folding tables from Home Depot, the shelves full of documentation. There are computers everywhere, living and dead. You'd think they were developing e-mail software (just as Qualcomm Inc. is in the complex next door). Or you would until you happened on the blond wig. Or looked into one of the cybersuites.

The cybersuites were, in part, Stephen Sayadian's idea. Sayadian is best known as the director of two cult movies: the stylish, apocalyptic porn flick *Cafe Flesh*, and the deeply deranged psychological horror-comedy *Dr. Caligari*. He lent a hand in developing Virtual Connections early on; the freak-show end of his aesthetic may not be in evidence, but he has definitely left his mark.

These were regular offices, once, but that was many renovations ago. Tom and Rod ripped out the false ceilings and slapped flat black paint on the walls. They put a 6-foot-square platform in the middle of each room and installed violet fluorescent lights around its base. There are props that look like football goal posts, made from sewer pipes and painted yellow. And everything – the platform, the computer and modem, the cabling, the walls – is draped in ratty purple cloth.

Each suite has two video cameras: one on a tripod next to the model's monitor, the other bolted to a mess of two-by-fours nailed to the wall. Up where the ceiling used to be, among the leftover standoffs, AC ducts, and Ethernet cables, hang the key lights.

This is a cybersuite. The term came from one of Tom and Rod's early bursts of home-grown public relations efforts: "Our enticing performers bask in a sultry 'cybersuite'



And since you can pull up roots in no time flat,

you don't need to worry too much about local community standards.

straight out of a sensual fever-dream. These 'cybersuites' are state-of-the-art, industrial environments of futuristic designs and vibrant colors equipped with two customer-controlled cameras.... As the caller controls the action, the computer screen transforms into a carnal keyhole. Each peek provides a thousand volts straight to the libido." (They have since hired a real PR firm.)

In the flesh, it doesn't look much like an "industrial environment of futuristic design and vibrant colors." It looks unbelievably shabby. But on the 2-inch screen, it's another story. The drapery, lights, and tubing look otherworldly. On the screen, you can't see the model's street clothes, the mirror behind the camera, or the spare pair of black pumps. You can't see the hole in the wall that Rod punched to give a photographer a little more focal distance for a brochure shot. Everything outside of camera range may be an utter shambles, but within that special frame, it's movie magic.

With their real office and their real employees, Tom and Rod can't hide their operation in the shadows the way most phone-sex outfits do. But I get the sense they wouldn't even if they could. They want to make a splash.

They succeeded in getting on the local TV news two nights running in November. In fact, they were the lead story both nights. This turned out to be not such a good thing.

The first night's segment was a typical smirker about "A new kind of sex – virtual sex." It featured one of the models dancing in a cybersuite, a few screen shots, and some sound bites from Tom and Rod. The reporter was knowing and sly, and the anchors made jokes with eyebrows raised after the segment.

The second night was also typical TV news, but of a different genre. The same anchors presided, but now the reporter was asking tougher questions. The tease ran, "A new company is selling virtual sex – and it may be against the law." The reporter got a vice detective to say, Well, yeah, if they have underage people looking at this, it could be illegal. And for balance, a local attorney said, Hey, remember we have a First Amendment.

Tom groans. "We wanted to go to vice before they came to us, but after that piece, we had to rush things."

Days after the segment aired, they arranged a show for the local vice department. "It was a really weird scene," says Tom. "There were all these huge cops huddled around the tiny screen, watching a strip. They didn't have any problems with our content. They were concerned about underage viewers. But once I showed them how we verify their ages, they were OK with that."

Which is not to say that vice has given

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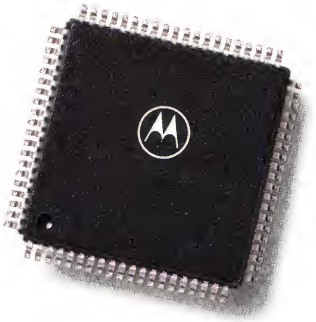

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"I was dancing before I had this job," says Brandi. "But this is better for me. It's just less commotion."

them carte blanche. Virtual Connections still needs to conform to local licensing and zoning requirements, which have nothing to do with signing up. And Tom and Rod have to ensure that neither they nor anyone working for them breaks any law.

Each of their models is presented with a set of written guidelines; the release the models sign includes an agreement to abide by them. "We don't make these rules," says Rod. "We're following the FCC's basic guidelines, the ones that the Playboy and Spice channels use." And if a model gives her phone number to a customer, he adds, "we'll turn her in to the police ourselves." The last thing they want to be accused of is pandering.

Their wariness extends all the way down to software licensing. "This may be the only company this size you'll ever see that has one copy of every program per machine," says Rod. "There are people who would fry us if we gave them a chance. This is the least corruptible industry I've ever worked in. Everyone's afraid of getting caught."

It's between shows, and Brandi is on the huge green sofa in Rod's office, taking slugs from a big plastic jug full of orange juice. Rod is ransacking his desk, looking for a missing diskette with increasing desperation, oblivious to the voluptuous young woman in the maroon velour teddy sitting across from him.

Like most of Virtual Connections's models, Brandi came to the business from another sector of the adult-entertainment industry. "I was dancing before I had this job," says Brandi. "But this is better for me. It's just less commotion. Also, at a club I'd be drinking a Bloody Mary instead of my Sunny D."

What does she tell people she does for a living? "I don't. Oh, it'll be great for my high school reunion. 'What do you do?' 'I'm a sex surrogate.' I just tell people I work for my friend's computer business."

Tom comes in with a model worksheet. A customer has called in to set up a show. He hands the sheet to Brandi. "He likes to be called Boyd."

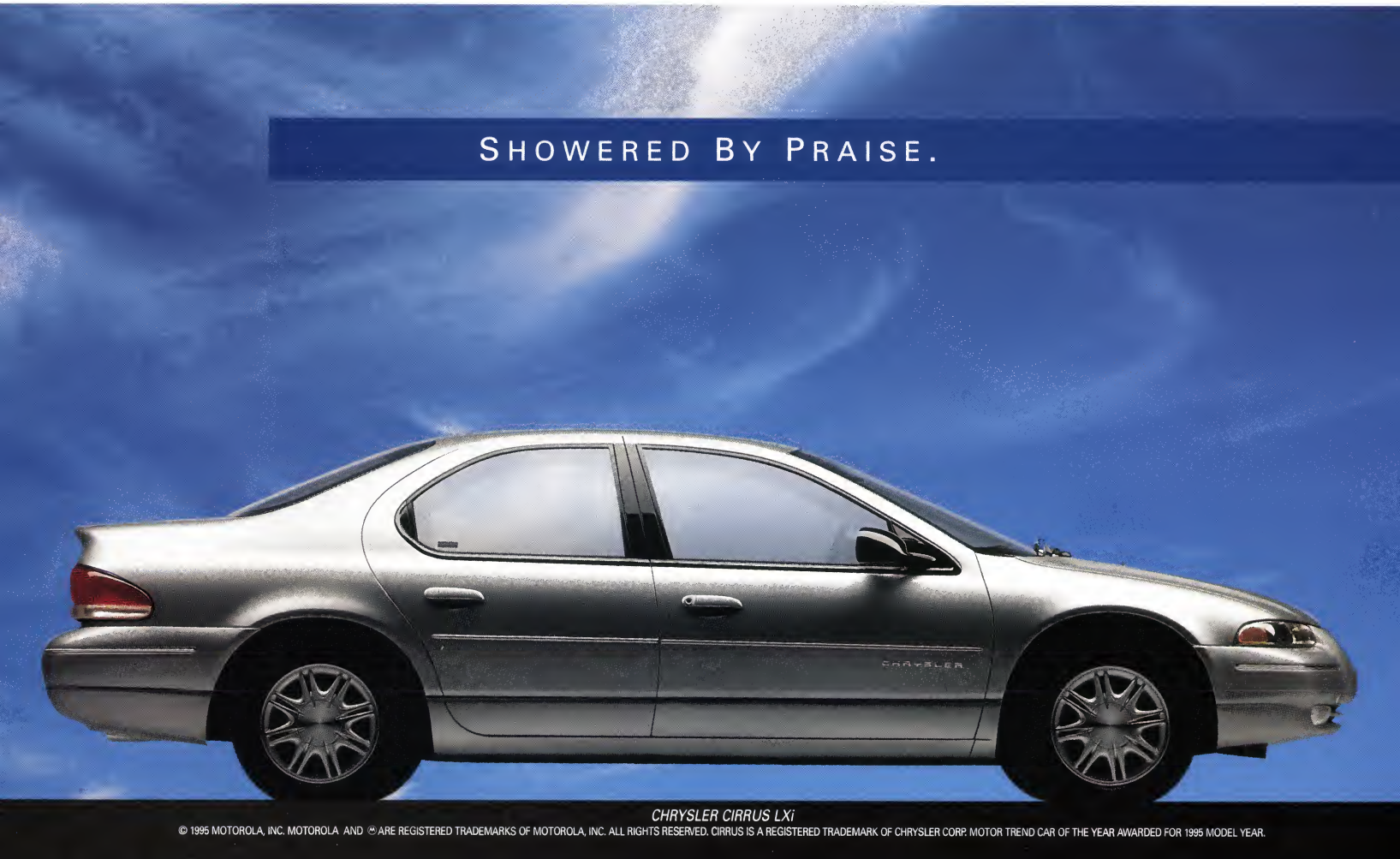
Rod looks up. "No kidding?"

"Really. He *asked* to be called Boyd."

"Cool," says Brandi, and she scurries off to the cybersuite.

Telling the family what they do for a living is a common problem for folks around the office. Not for Rod, whose parents know enough of what he's up to for his father to call from Las Vegas asking if Rod wants to be introduced to an agent he knows. ("John Bobbitt?" Rod asks him. "What the *hell* am I going to do with John Bobbitt?") But it's an issue for everyone else.

"I *almost* told my mom," says Tom. "She still doesn't know. I wasn't two sentences



Phone sex is best approximated by stacking several dozen dollar bills on your bedside table, setting the pile on fire, and watching it burn while you masturbate.

away from telling her, and something about condoms came on the TV. She said" – and here he slips into a thick Hungarian accent – "Vat is this country coming to?" He shakes his head. "I was that close."

Naturally, I had to try it myself. This is the next step in the boys-and-their-toys phase of the digital revolution. It's boys and their toys and the toy God gave them. I couldn't pass it up. Mom, I'm sorry you have to read this.

I can't claim that my encounter is truly representative. Phone sex is best approximated by stacking several dozen dollar bills on your bedside table, setting the pile on fire, and watching it burn while you masturbate. You can put out the fire when you're finished. My call was a freebie, and so was missing this essential *frisson.*

What first grabbed me, nerd that I am, was that it was *cool.* Two frames per second is a long way away from the illusion of true movement, but it didn't matter: each picture showed a total stranger, hundreds of miles away, responding in real time to what I said. It wasn't movement, but something even better: *feedback.*

Sexually, the video image of the woman did little for me. The mediascape is so cluttered with images of jiggling breasts and jutting pelvises and girls licking their lips that they scarcely get my attention anymore. So this particular avatar of the babe in the thong bikini didn't turn my crank.

There is also the matter of taste. My own seems to run to small-featured brunettes in thick glasses who read Apollinaire in the original and phone at two in the morning threatening suicide, a type woefully underrepresented in the iconography of American adult entertainment.

But feedback is trumps. It's one thing to look at a picture of a scantily clad woman. It's another thing entirely to ask her to remove an article of clothing and see her respond by whipping off her panties and flinging them aside. It gets your attention.

But strangest of all was this: nudity and salacious talk notwithstanding, what stuck with me after the show was the way she brushed the hair from her face as she bent to type a reply.

It was a casual, unscripted, honest, and oddly intimate moment. The glimpse of her face as she concentrated on entering her response hit me with an unexpected pang of longing. I carried this frozen frame in my head for days after breaking the connection.

This is what the digital revolution has been waiting for. They've eroticized *typing.* ■ ■ ■

Robert Rossney writes the Online column for the San Francisco Chronicle.

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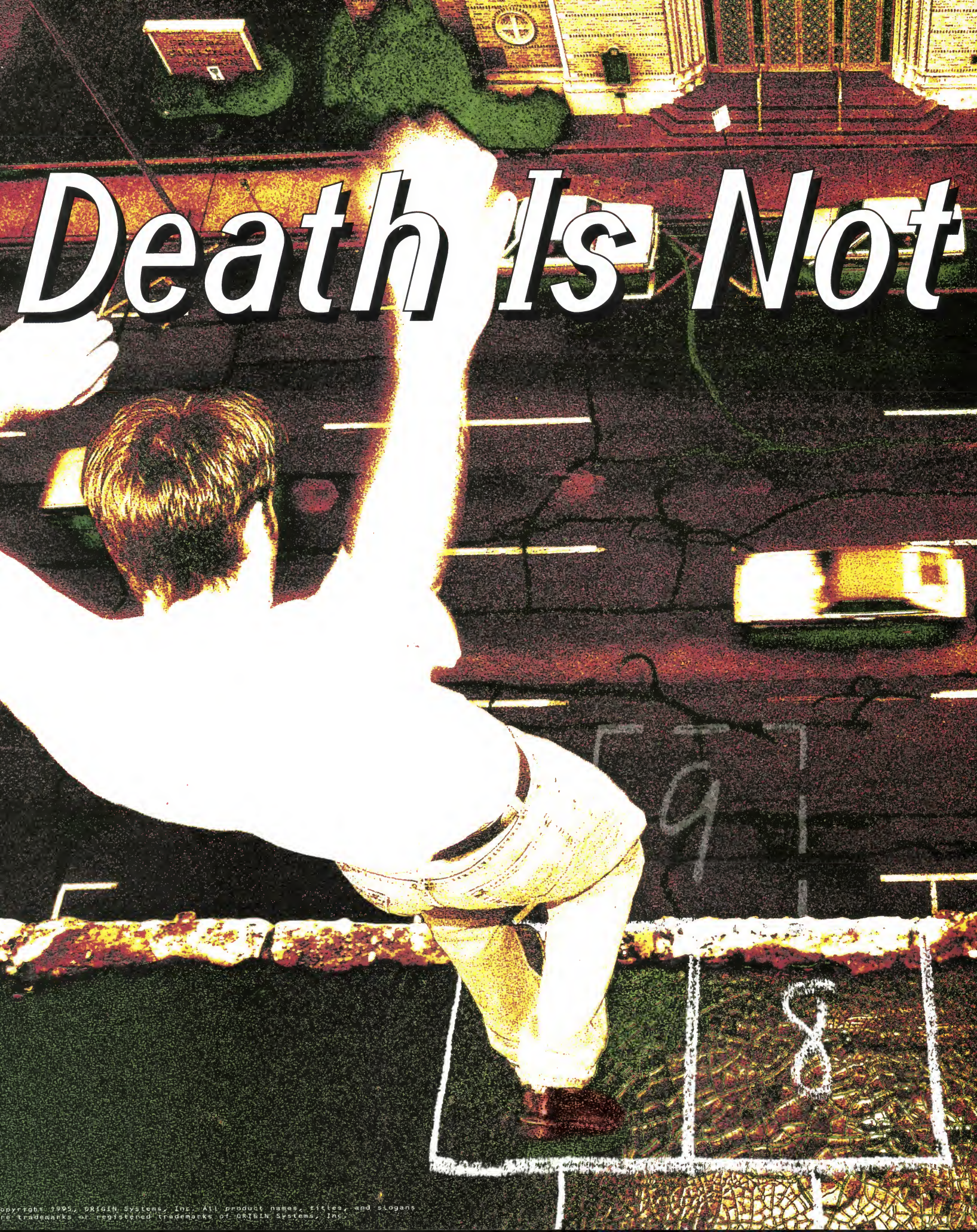

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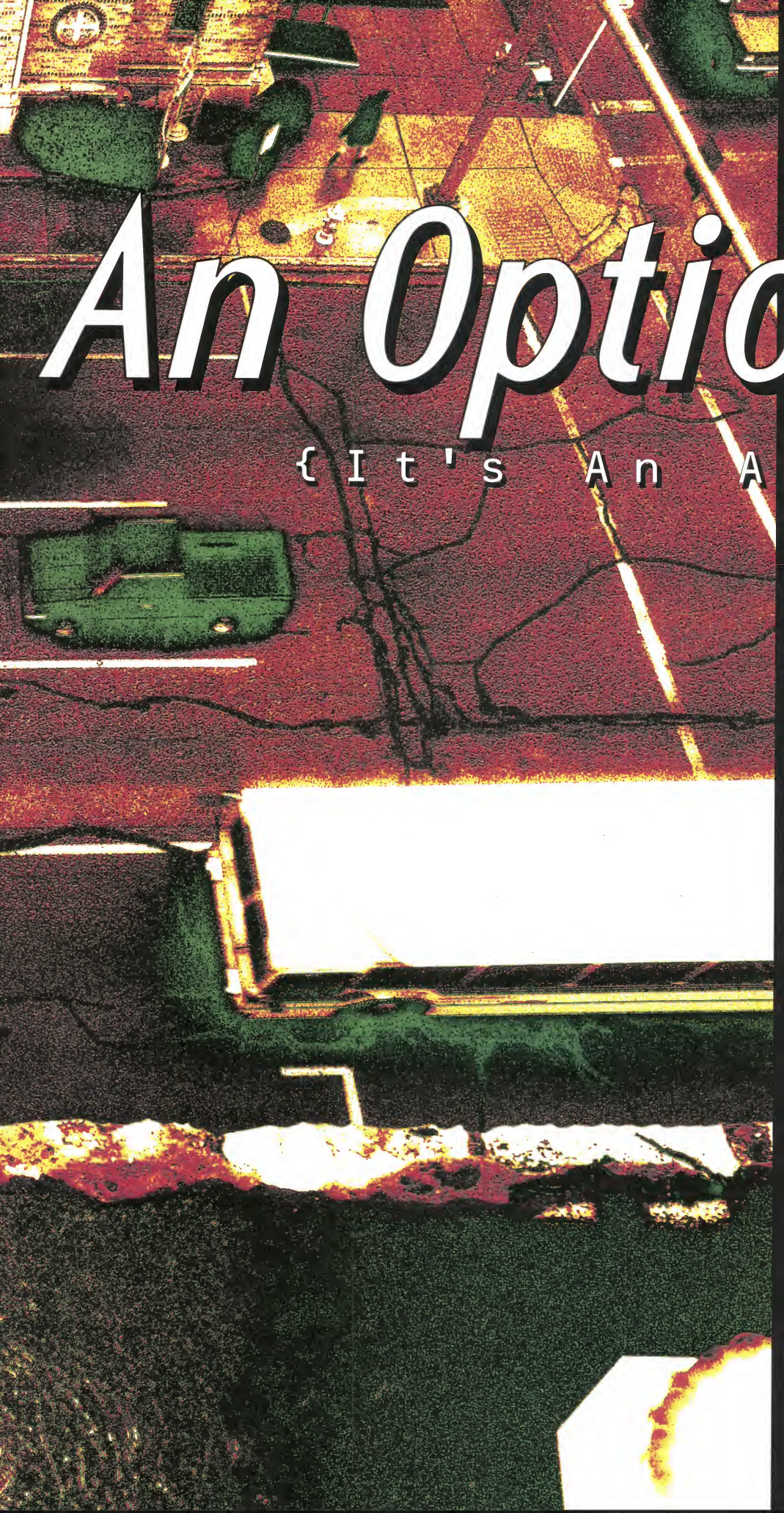

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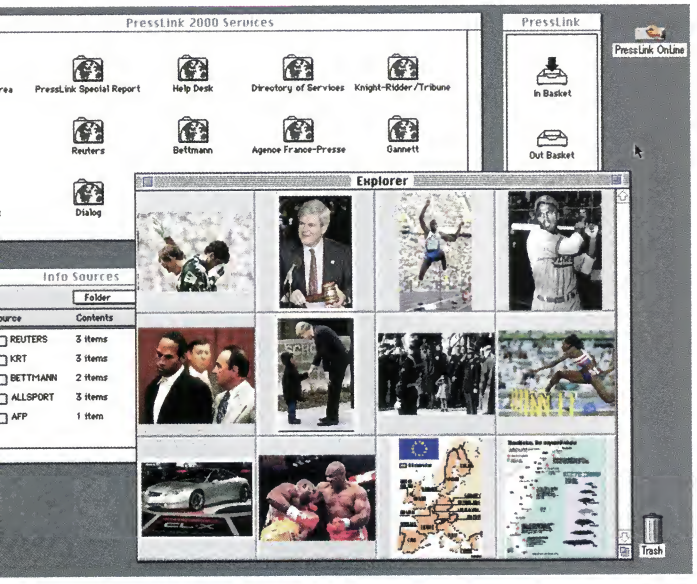
News photography is flourishing in the digital era, even as skeptics question whether seeing is deceiving.

By Jacques Leslie

When President Clinton went sailing off Martha's Vineyard with singer James Taylor last August, Associated Press photographer Stephan Savoia took pictures of the seafaring celebrities from a boat 130 yards away. Nothing unusual about that, except that when Savoia finished shooting he didn't develop his film – he had no film to develop. Instead, he removed a pocket-sized hard drive from the side of his camera, slipped it into a docking station attached to a PowerBook, and reviewed all 30 of his shots on the laptop's screen. After selecting his favorite image, he fine-tuned its colors, wrote a caption, and then, using a cellular phone, transmitted both image and caption to a central computer at AP's New York headquarters. Even though Savoia was slowed by bouts of nausea as he worked in the cabin of the pitching boat, the process took him only 15 minutes. The photograph was in newsrooms around the country long before Clinton ever reached shore.



Technology frees photographers from the darkroom, but it jeopardizes the credibility of the images they shoot.

The crucial piece of gear in Savoia's time-saving gambit was, of course, a digital camera, the crowning tool in the ongoing electronic transformation of news photography. Savoia's camera, the US$15,500 AP NewsCamera 2000, came on the market a year ago, but even before then, news photographers were using darkrooms for nothing more than developing film; instead of using enlargers to make prints from negatives, they scanned negatives into computers and edited them using imaging programs such as Photoshop. Though the digital camera is still a specialty tool, whose use is limited by cost, conspicuousness, and a need for brightly lit subjects, it offers news photographers the option of capturing images without film.

The advent of digital technology has already scrambled job descriptions within news photography departments – it enables photo editors to take on production chores once performed by technicians and loosens photographers' control over the images they shoot. The elimination of prints has saved news organizations millions of dollars in paper and chemicals, and it has spared the environment many of the toxins. Electronic technology has also fostered an effusion of color photographs in news publications. But the malleability of digitized images has cast doubt on the credibility of those same photographs. And it has turned news photographers, once considered the bravest of professionals, into nerds who expose themselves to gunfire in the quest for images and then discuss their specifications in megabytes and pixels.

Many photojournalists say the turning point in news photography's electronic conversion was the Associated Press's move in 1991 to distribute images to its 1,000 newspaper and magazine photo clients in digital form. To facilitate the change, AP provided computer-based receivers called "electronic picture desks" to the clients at nominal cost. The picture desks, which enable users to receive, view, and edit digital images, ended the era of low-quality analog photo distribution. The transmission of color photographs, which formerly took 30 minutes, dropped to 20 seconds; transmitting black-and-white images went from 8 minutes to 8 seconds. As a result, AP tripled the number of images it sent to subscribers and delivered all of them in high-resolution color. Not only did newspapers suddenly have a much greater selection of wire-service photographs, but they were spared the expense of printing them; in paper alone, that savings amounted to several hundred dollars a month, a sizable amount for small newspapers. Other wire services soon joined AP in providing digital delivery of news photographs; 75 agencies including Reuters, Agence France Presse, and Knight-Ridder/Tribune went a step further, offering individual images for sale online via modems, local access numbers, and a service called PressLink.

One result was that subscribers abruptly faced an abundance of bewildering and potentially expensive choices. Photo editors could now browse, size, and color-balance images stored inside electronic picture desks, but the picture desks could receive wire-service photos only. If the editors wished to raise the quality of their own staffs' photographs to the new digital standard, they needed to buy scanners, which could transform images on negatives into the digital data required by the picture desks; thus, AP markets scanners for negatives, which

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range in price from $8,750 to $15,000. In addition, picture desks enhanced the utility of portable picture transmitters, which enable photographers in the field to scan negatives, edit the digitized images, and transmit them to home offices over telephone lines; such packages that attach to Macintosh PowerBooks sell for about $5,000. Further, unless publications invested in digital output devices, which maintain images' digital characteristics through much of the production process, they'd lose part of the image quality that picture desks generate. Digital output units range from $30,000 up to hundreds of thousands of dollars.

If these choices sound forbidding, consider the opportunities they have opened up. For example, the *Los Angeles Times*, which five years ago received no more than a few images from news agencies each day, now collects 750 to 1,000 wire service pictures daily, and the number of color photographs in the paper has quintupled. The switch to digital technology also means that images shot by *Times* photographers, even images that aren't carried in the newspaper, can easily be published in electronic forms such as CD-ROMs or the *Times*'s online service. Drawing on its photographs, the *Times* has already produced a CD-ROM on the April 1992 Los Angeles riots and a videotape on the October 1993 Southern California fires.

At the same time, the switch to digital technology has sufficiently simplified the production process so photo editors can now perform chores that previously required technicians' skills; in some newspapers, the technicians' jobs have been eliminated, while at others, the technicians have been reassigned to handle color advertising. Either way, the shift has confounded the expectations of editors who thought the technology would lighten their workload.

"While I'm talking to you," says J.B. Forbes, the *St. Louis Post-Dispatch*'s director of photography during a phone interview, "I'm scanning a picture, sizing it, color-correcting it, putting the proper slug on it, and sending it to the computer that will deliver it to the [printing] plate, bypassing all sorts of people who used to do that kind of thing."

Freed from the darkroom, photographers find that they have more time to spend covering stories; the greatly reduced transmission and processing times mean that they can work on stories hours closer to their deadlines. If they are using digital cameras – still rarities at all but the largest news organizations – the time benefit can be even greater. AP photographer Savoia likes to think about the difference a digital camera would have made when he was covering the 1993 floods in the Midwest. Savoia spent five weeks driving through the region searching for inundated areas. When he found one, he'd shoot until noon or 1 o'clock; then he'd drive to a town with functioning phone lines, develop and scan his film, then edit and transmit the best images in time to meet Eastern newspapers' mid-afternoon deadlines. However, if he'd been equipped with a digital camera, he says, "I could have stayed in a boat shooting until 3 o'clock, then gone back to my car, pulled out the computer, plugged it into the cigarette lighter, put the cell phone on the roof, and bingo, by 3:15, I could have had a picture or two in New York. In a situation like the floods, a digital camera allows as much as three more hours of coverage time."

"Photographers are feeling a little nervous, and justifiably so," says *Time*'s Arthur Hochstein. "Because they see the power of the image shifting away from them."

The irony is that while digital technology frees photographers from the darkroom, enabling them to spend longer hours in the field, it has jeopardized the credibility of the images they now have more time to shoot. Most photojournalists believe the only alterations that ought to be performed on their images are the traditional techniques of darkroom printing: enlarging, cropping, burning, and dodging. However, Photoshop and other imaging programs enable users to make an infinite array of changes seamlessly and nearly effortlessly. In some cases, the alterations are obvious, as when *Time* magazine ran a picture of a pig's head on top of a man's body to illustrate a story on male piggishness. It's when the manipulations are imperceptible that controversy arises. John Long, a past president of the National Press Photographers Association who frequently lectures on photographic ethics, says such alterations are tantamount to lies. "If we start lying to the public," he says, "we destroy our credibility, we destroy our newspapers, we destroy everything we stand for."

Every photojournalist can rattle off a list of images that became notorious after revelations that they had been digitally manipulated. As far back as February 1982, *National Geographic* moved two Egyptian pyramids closer together to fit them both on the magazine's cover. Two months later, *National Geographic*'s cover image of a Polish man included part of his hat grafted from a second photo. Six years ago, *Newsweek* carried an image that appeared to show Dustin Hoffman and Tom Cruise standing side by side, even though the two had been shot separately. A missing Diet Coke can provoked controversy after the *St. Louis Post-Dispatch* deleted it from a photo of a Pulitzer Prize winner. *Texas Monthly* was rebuked for two altered cover images of Governor Ann Richards: in one, Richards was dancing with her 1990 election opponent, while in the other, she was riding a Harley-Davidson; in both instances, her head was placed over models' bodies. (After the motorcycle cover appeared, Richards said that since the model had such a nice body, she could hardly complain.) Last year, a *Newsday* cover showed Olympic figure skaters Tonya Harding and Nancy Kerrigan skating together when they hadn't yet met on the ice, and, in what became the most controversial image of all, *Time* carried a digitally darkened version of an O.J. Simpson mug shot on its cover.

Most newsmagazines and newspapers have embraced the National Press Photographers Association policy calling alteration of a photograph's editorial content "in any degree a breach of ethical standards." However, the exceptions – *Time* and *Newsday* among them – suggest the difficulty that photojournalists face in enforcing the rule. While most large newspapers oppose deceptively manipulating images, their stance is undermined by the more freewheeling practices of magazines. Some magazines even make a distinction between covers, which they describe as posters and sales tools, and photos inside. For example, Arthur Hochstein, *Time*'s art director, candidly states that the magazine has run "scores" of digitally altered cover photos while maintaining that photographs inside the magazine are manipulated "much less frequently."

Many photojournalists maintain that the ethical battle has exposed a rift between photo editors, who consider themselves journalists, and art directors, who frequently don't:

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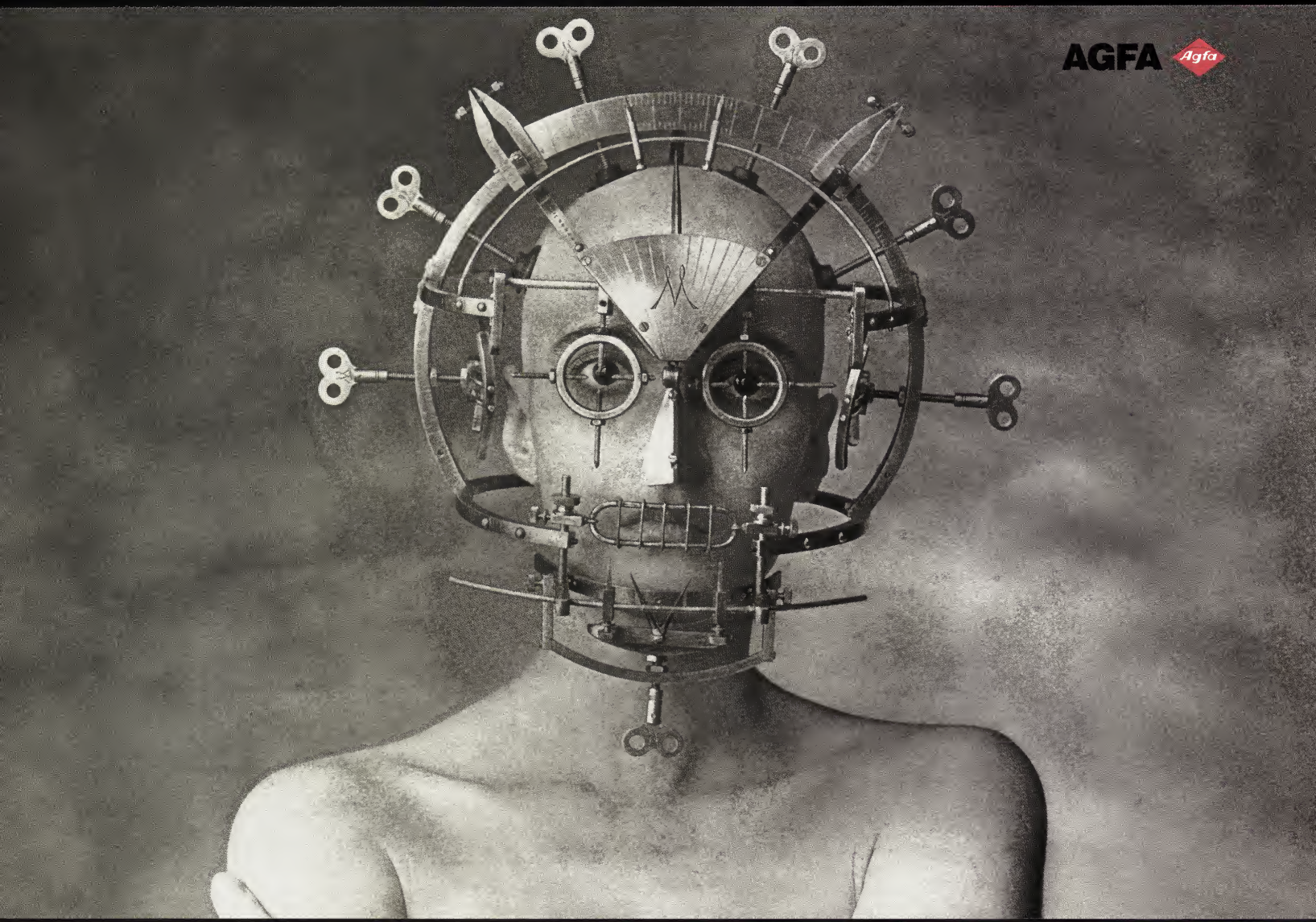

it's art directors, smitten by their enhanced ability to produce montages and "photo-illustrations," who are far more likely to embrace digital manipulation. "It's a more exciting time for art directors," Hochstein says, "but you can see who's winning the power struggle. The photographers, who used to be the keepers of the image, are feeling a little nervous, and justifiably so, because they see the power of the image shifting away from them."

But the prominence of digital technology has at least one perverse effect: while it has focused attention on the ethics of manipulation, thereby creating the perception that alteration of news photographs is at an all-time high, the opposite is probably true. Joe Elbert, *The Washington Post*'s assistant managing editor for photography, says that in the not-so-distant, pre-computer past, retouchers routinely removed objects from some photographs and occasionally added them to others. "It's amazing," he says. "When you pull pictures from the morgue, you find instances where people's faces have been painted out with a brush." Contrast such an approach to that of Baron Sekiya, chief photographer for a 16,000-circulation newspaper called *West Hawaii Today*, who speaks for many contemporary photojournalists when he says, "Now it is so easy to manipulate a photograph and make it look believable that we tend to go to the other extreme."

Computer technology has so confused the public that in at least a couple of instances, publications have been wrongly accused of digital manipulation. In 1989, for example, *TV Guide* ran a cover image of a conspicuously slender Oprah Winfrey, and was widely assumed to have digitally grafted Winfrey's head onto actress Ann-Margret's body. However, the image wasn't a photograph at all, but a drawing, rendered by an artist who had used an image of Ann-Margret's body for reference. In 1992, *Texas Monthly*, already censured for its deceptive Ann Richards covers, ran an unaltered cover photograph showing a controversial Texas government official sitting on top of an oil derrick; since the photograph looked implausible, the immediate assumption was that it was falsified. D.J. Stout, *Texas Monthly*'s art director, says, "I realized at that point that the altered photographs were really hurting the integrity of the magazine's cover, to the point that when we had a great photograph, nobody believed it." Since then, the magazine has instituted a policy of resisting digital alteration unless the changes are overwhelmingly obvious to the viewer.

To distinguish digitally altered images from unaltered ones, a committee on photographic standards at New York University has proposed that manipulated images be accompanied by a "not-a-lens" symbol – a circle inside a square with a diagonal slash and a description of what in the picture was changed. The idea has received substantial attention, but it's unlikely to work. The symbol's absence might signify that a photograph is legitimate, or it might simply mean that its publisher declines to display the icon. After all, wouldn't a publication that wished to deceive its readers be unlikely to denote its deceptions with a symbol? A better approach might be to remind readers to view photographs with the same healthy skepticism they apply to the written word.

"The altered photographs we had done were really hurting the integrity of the magazine's cover," says *Texas Monthly*'s D.J. Stout, "to the point that when we had a great photograph, nobody believed it."

Most photojournalists are reluctant conservatives in this ethical tussle, inveighing against the temptations of computer applications that have already been embraced in movies and many kinds of commercial photography. Even if they succeed in cordoning off the news photography domain – something that is not assured – they risk being engulfed by altered images from other realms. It's a poignant moment. A century and a half ago photographs relieved paintings of the burden of recording reality; now, in turn, computers have weakened photography's claim on depicting the "real" world. For all of computers' extraordinary precision, their impact in news photography has been to obscure the boundaries of fact and fiction. In other words, to blur. ■ ■ ■

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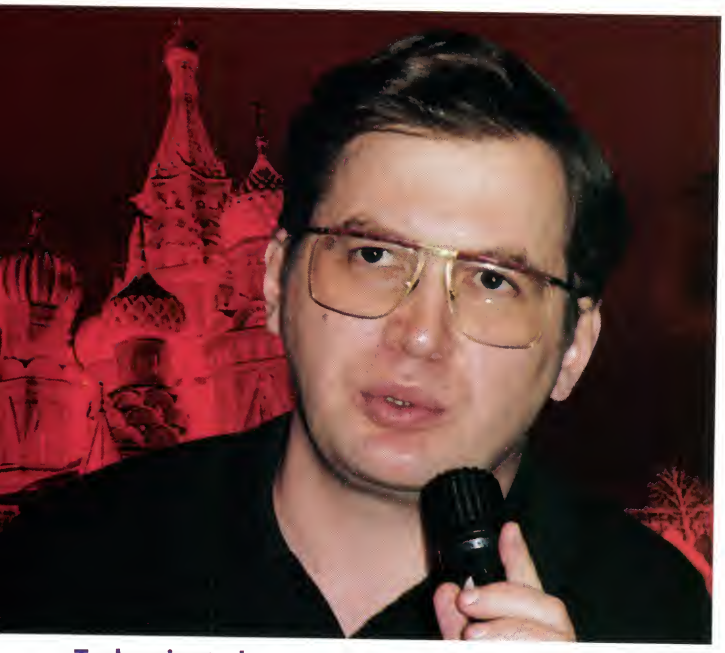
The New Russians

Long the pioneers in Russian culture, scientists and technologists are trailblazing the newest frontier – business.

By Masha Gessen

The scene outside Moscow's Manhattan Express would be easily deciphered by any New Yorker. The fidgeting in the crowd, the push toward the velvet ropes, the young women scrutinizing the crowd from behind those ropes, the burly security guards looking on – anyone can see that this is a happening night spot. The crowd is aggressively self-righteous. Tatiana Lavrionova, the executive producer at Moscow's hottest movie studio, is helping with face control, and she seems overwhelmed. "These must be all *tekhnari*," she says dejectedly. "Movie people are never this stylish!"



Tech-oriented "New Russians" like Sergey Mavrodi have managed to ride the wave of economic and social change that has shaken Russia.

This bunch *is* stylish. The revelers look like they have been airlifted straight from a CK One ad shoot and dropped in the center of Moscow. These are the "New Russians," a mythologized new breed that managed to ride the wave of economic and social change that has shaken the country in the last five years. Surveys consistently show that most Russians have been badly battered by the changes. More than half the population now lives below the poverty line. Suicides have jumped 40 percent in two years. Recently, domestic media have coined the term "New Russians" to denote people who have money, style, and a belief that life is good and getting better.

The phenomenon is too new to have been studied by sociologists or statisticians. But appearance and popular wisdom would say that Lavrionova is right: overwhelmingly, New Russians are techies – tekhnari in Russian – the same group that has comprised Russia's cultural élite for more than three decades. These are computer scientists and physicists, mathematicians and engineers – the people who graduated from the country's high-pressure technical schools and went on to universities and defense-ministry research institutes. Along the way, they have shaped the country's intellectual culture. Quirks of the system conspired to create this improbable social class. Unlike people involved in intellectual pursuits in the humanities, tekhnari were generally left alone by the overseers of ideology. And, since more than 80 percent of the tekhnari were employed by the defense industry, many of them spent their lives in closed towns populated entirely by their colleagues (there were at least four such towns just outside of Moscow). This segregation spawned strong communities of intellectuals who formed the leading edge of the main cultural developments in Russia.

In the idealistic '60s, they made up the nucleus of the dissident movement, which resisted the régime. The movement was launched by the mathematician Aleksandr Yesenin-Volpin, inaugurated with a scandal that involved 99 engineers and mathematicians, and was led largely by the physicist Andrei Sakharov. In the repressive '70s, when much of the intelligentsia sought refuge in nonpolitical activities, the tekhnari made two of them into full-fledged fads: mountain climbing and folk singing. The first Moscow concert of Vladimir Vysotsky, the folk-singing popular hero of the '70s, took place in the Culture Hall at the Kurchatov Institute of theoretical physics, the birthplace of the Russian A-bomb. In 1981, the same hall hosted Moscow's first rock concert.

Over a decade later, tekhnari lead the way in conquering the newest frontier: business. The man now reputed to be the country's richest, Sergey Mavrodi, is a computer scientist-cum-stock market shark; the country's second-largest bank, Tver Inkombank, was founded by physicists; and small- and medium-size businesses seem downright dominated by the tekhnari. No one has done a statistical breakdown of Russian entrepreneurs by profession, but Ivan Kivalidi, president of the Russian Business Roundtable, an association of entrepreneurs, confirms the impression that business is dominated by tekhnari.

"We studied to be engineers or physicists, and now some are composers and others are traders," says Nikolai Polushkin, a 33-year-old theoretical physicist-turned-fashion designer. "This should not come as a surprise: tekhnari – especially Kurchatov physicists – have always been the most progressive people in Moscow, and now we are starting our own thing and creating a new culture."

Polushkin's assertions are as self-serving as they sound: he graduated in 1985 from the Moscow Engineering and Physics Institute (MIFI), an élite institution with a pipeline to the Kurchatov Institute, where Polushkin worked until 1988. He started sewing in 1986 when, following the Chernobyl nuclear power plant disaster, he realized nuclear physics would never be the cushy field it once was. It is Polushkin who has drawn the crowd to Manhattan Express on this night: he is showing his fashions, conceptual creations in silk that landed the designer

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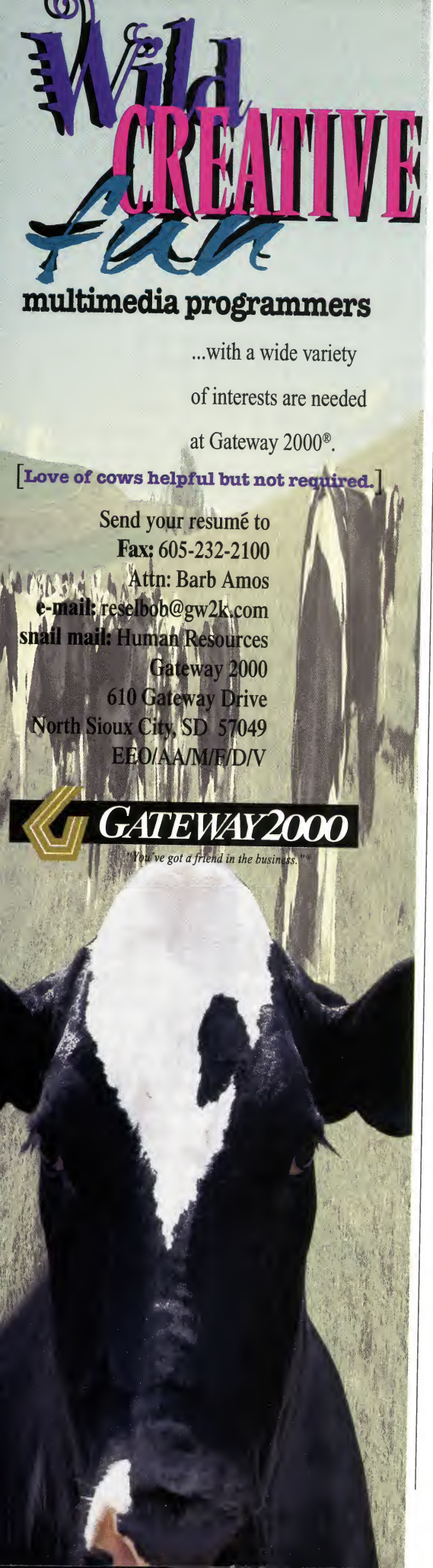

on the front page of *Izvestiya*, Russia's largest daily. He says his success in fashion – his outfits go for US$1,000 – has come naturally, in no small part because he has moved up the economic ladder together with his peers. "Gradually, I became better," he says, "and I kept making clothes for friends who were becoming store owners, presidents of computer companies, producers."

Tekhnari reinvent themselves

"All of our techie friends have gone into the music business or the clothing business," claims Larisa Protasova, a 1986 MIFI graduate in computer science who, with 1986 MIFI systems-engineering grad Liudmila Abramova, has been designing and manufacturing women's clothing for two and a half years.

"I made a realization a year ago," claims Polushkin. "I discovered that the real power is not with the politicians or the masses, but with us, the young entrepreneurs."

They are among Polushkin's peers who have struck out into business. "It became very difficult to survive in the high-tech field," explains Abramova. "MIFI professors now make 200,000 rubles [$60] a month." (In the old days, they made several hundred dollars a month and could afford virtually anything; now that prices have reached Western standards, they are poverty-stricken.) "So these people, though they liked what they were doing in the sciences, turned to their hobbies, and those became businesses."

Abramova, 31, and Protasova, 30, are an odd-looking couple: the first is barely over 5 feet tall, bodacious with a copper helmet of hair; her dark-haired partner is extraordinarily tall and lanky. No wonder the two engineers who'd never been able to find properly fitting suits decided to make elegant clothes "for real women, not models," as they proclaim in unison. They borrowed about $1,000 and bought a sewing machine and some cloth. Now seven Moscow stores and 30 regular clients buy their $100 suits and $20 blouses. After just four months in business, Abramova and Protasova were able to quit their engineering jobs and start hiring seamstresses. At one point, they had 10 people working for them; now they have cut down to their four best workers – all former engineers. "We've given up on professional tailors," chirps Abramova. Tekhnari, she says, "make the best workers: they are the most responsible and the most inventive.

"Tekhnari are practical-minded. We know that if you are given information, there must be a solution. It may not be the solution you envisioned, but there is always a solution." Protasova nods enthusiastically. Here, the pair is no longer talking about clothing manufacturing: their theory holds for life – the ability to survive, under ever-changing, almost chaotic conditions. Like other tekhnari-turned-entrepreneurs, Abramova and Protasova claim that what distinguishes their colleagues from the rest is an ability to react quickly and constructively.

Fateful accidents

The transition from engineer or researcher to entrepreneur has not been as conscious for many as it was for Polushkin, who picked a new field and dived into it. For Vadim Rakhovsky, who headed a Defense Ministry technical think tank for over two decades, his entry into the world of business was pure accident. About four years ago, he was on a flight from Moscow to New York, struggling to go to sleep despite two inebriated men continuing a loud discussion of lumber-shipping problems. "I could not go to sleep to their squealing," barks Rakhovsky, a man who is clearly used to having his way. "Finally, I turned to them and said, 'Tell me your problem. I'll solve it, and then we'll go to sleep.' They explained to me that it had become unprofitable to dry timber since fuel prices went up.

"The solution was plain to see. They were using great amounts of fuel to dry the wood because of the huge difference between the temperature inside and outside the drier. All they had to do was pump out the air, creating a vacuum and causing the temperature at which water boils to fall to 41°C." So, using a rule most Russians learn in high-school physics – that evaporation occurs faster in a vacuum – the esteemed scientist solved the lumber problem and, without knowing it, transformed the think tank, which was just then losing its federal funding, into Antekh, an R&D firm that develops not only vacuum lumber-drying chambers, but vacuum switches, marble furniture veneers, and

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Mark Nemoyter, 45, also fell into his business. A former software engineer, he now heads a company called SBS, and takes in $5 to $6 million annually. His company's main lines of business are importing raw materials for the tobacco and food industries and designing and constructing small hydroelectric plants. The former activity, according to Nemoyter, is the most promising line of business in today's Russia because it offers the highest profit margin. The latter is an *idée fixe* of his partner, an engineer who spent two decades attempting to convince gigantism-afflicted Soviet authorities to construct small power plants.

Sitting in his office – a gray-carpeted, Western-style oasis in the center of Moscow – the plump, rosy-cheeked Nemoyter looks like a Type A personality in heaven. "My work is so interesting," he brags. "Every day I have to solve at least five major problems or 10 lesser ones. Take, for example, what I went through when we got our first shipment of coconut oil from Singapore. We needed to have safety certificates. First, it took the agency a week to get to us while I had to pay $200 per container per day for storage. They found the radioactivity was 10 times the legal maximum. Ten days later, after we appealed, they admitted they'd made a mistake, but said the lead content was too high. Finally, they made it clear: certificates cost $1,000 per container – no testing required – or no certificate, regardless of what we have in there." All it took was a bribe. "Now I tell you," continues Nemoyter, "no Western businessman has ever dreamed of the kinds of problems we encounter here every day."

Peter Sharow, the executive director of the American Chamber of Commerce in Russia, agrees. "The kind of obstacles entrepreneurs face here are enough to scare away many American businesses," he says. "Just the 22 different taxes will do that."

But the written laws are the least of it: it is the unwritten rules by which entrepreneurs have to compensate everyone – from the certificate-issuing agency to the local protection racket – that have Russian business people always battle-ready. These techie-entrepreneurs, like other business people, are understandably reluctant to discuss their relationships to organized crime, but all acknowledge that it is an ever-present part of doing business in Russia. For some of them, it cramps their style: Nemoyter says he drives a beat-up Soviet-made Fiat, keeps the outside of his summerhouse unpainted, and stays home most nights to avoid drawing more unwanted attention from the Mob.

Confidence is its own reward

Rather than grow dejected as they complain, these new Russians seem to relish their problems: they see themselves as warriors. "The relationship between the government and the entrepreneurs is best compared to gang rape, except the group being raped is far larger than the group doing the raping," says Kivalidi. And where the state lets up, organized crime turns on the pressure. "But as a result, the Russian entrepreneur compares favorably to his Western counterpart: he is always alert and in good shape, like a marathon runner."

Such is the trade-off: these tekhnari have given up their old social status – that of the cultural élite – in exchange for the self-image of a trailblazer. They believe they are heroes, even somewhat self-sacrificing heroes. "In a normal society," says Protasova, "tekhnari will work with computers and whatever else they were trained to do, but we do not live in a normal society, so this is what we *have* to do." There is a note of nostalgia in this statement: these newly minted entrepreneurs do miss their old work, but the payoff, they say, was well worth the sacrifice.

"I look at people who stayed in software," says Nemoyter, "and they are making decisions about whether they can buy sausage or good cheese this week. Meanwhile, I make decisions that affect the lives of the 35 people who work for me. All my life I was told I was a cog in the wheel. Only in the last five years have I realized this was not so." This is probably the biggest benefit of being a businessman in today's Russia: confidence, a rare trait these days. In a population that has seen everything slip away, this is a small group that feels it has gained – not lost – its power.

Perhaps because, as Abramova would say, they have found a solution – though it may not be the one envisioned when they chose their professions.

They seem to feel they can do anything. "I made a realization a year ago," claims Polushkin. "I discovered that the real power is not with the politicians or the masses, but with us, the young entrepreneurs."

The militant Kivalidi, from an older generation, drops the word "young," but his sentiment is the same: "Entrepreneurs will rule the country," he says. "It is inevitable." ■ ■ ■

Moscow-based Masha Gessen (mgessen @glas.apc.org) *writes for* Novoye Vriemia (New Times), *a weekly political magazine.*

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Bruce Sterling has a "frank chat" with some cops.

Last November, sci-fi writer Bruce Sterling addressed police and private security officers at the High Technology Crime Investigation Association. The transcript of his talk has been edited for Wired. *The best thing that can be said for the speech, Sterling quips, is that it allowed "American law enforcement personnel to receive training credits for sitting still and listening to it."*

My name is Bruce Sterling, and I'm a sometime computer crime journalist and a longtime science fiction writer from Austin, Texas. I'm the guy who wrote *Hacker Crackdown*, which is the book you're getting on one of those floppy disks that are being distributed at this gig like party favors.

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People in law enforcement often ask me, Mr. Sterling, if you're a science fiction writer like you say you are, then why should you care about American computer police and private security? And also, how come my kids can never find any copies of your sci-fi novels? Well, as to the second question, my publishers do their best. As to the first, the truth is that I've survived my brief career as a computer-crime journalist. I'm now back to writing science fiction full time, like I want to do and like I ought to do. I really can't help the rest of it.

So why did I write *Hacker Crackdown* in the first place? Well, I figured that somebody ought to do it, and nobody else was willing. When I first got interested in Operation Sundevil and the Legion of Doom and the raid on Steve Jackson Games and so forth, it was 1990. All these issues were very obscure. It was the middle of the Bush presidency. There was no information-superhighway vice president. There was no *Wired* magazine. There was no Electronic Frontier Foundation. There was no Clipper Chip and no Digital Telephony Initiative. There was no PGP and no World Wide Web. There were a few books around, and a couple of movies, that glamorized computer crackers, but there had never been a popular book written about American computer cops.

When I got started researching *Hacker Crackdown*, my first and only nonfiction book, I didn't even think I was going to write it. There were four other journalists hot on the case who were all better qualified than I was. But one by one, they all dropped out. Eventually, I realized that either I was going to write it, or nobody was ever going to tell the story. All those strange events and peculiar happenings would have passed without a public record. I couldn't help but feel that if I didn't take the trouble to tell people what had happened, it would probably have to happen all over again. And again and again, until people finally noticed it and were willing to talk about it publicly.

Nowadays it's different. There are about a million journalists with Internet addresses. There are other books around, like for instance Katie Hafner and John Markoff's *Cyberpunk: Outlaws and Hackers on the Computer Frontier*, which is a far better book about hackers than my book. Paul Mungo and Bryan Clough's book *Approaching Zero* has a pretty interesting take on the European virus scene. Then there's *Cyberspace and the Law* by Edward Cavazos and Gavino Morin, which is a good practical handbook on digital civil-liberties issues. This book explains in legal detail exactly what kind of modem stunts are likely to get you into trouble. (This is a useful service for keeping people out of hot water, which is what my book was intended to do. Only this book does it better.) And there have been a lot of magazine and newspaper articles published.

Basically, I'm no longer needed as a computer-crime journalist. The world is full of computer journalists now, and the stuff I was writing about four years ago is hot and sexy and popular. That's why I don't have to write it anymore. I was ahead of my time. I'm supposed to be ahead of my time. I'm a science fiction writer. Believe it or not, I'm needed to write science fiction. Taking a science fiction writer and turning him into a journalist is like stealing pencils from a blind man's cup.

Even though I'm not in the computer-crime game anymore, I do maintain an interest. For a lot of pretty good reasons. I still read most of the computer-crime journalism that's out there. And I'll tell you one thing about it: there's way, *way* too much blather going on about teenage computer intruders, and nowhere near enough coverage of computer cops. Computer cops are at least a hundred times more interesting than sneaky teenagers with kodes and kards. A guy like Carlton Fitzpatrick – a telecom crime instructor at the Federal Law Enforcement Training Center in Glynco, Georgia – should be a hundred times more famous than some wretched hacker kid like Mark Abene. A group like the Federal Computer Investigations Committee is a hundred times more influential and important and interesting than the Chaos Computer Club,

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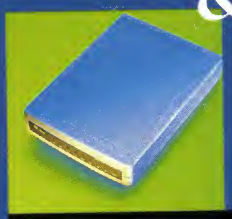

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The United States Secret Service is a heavy outfit. It's astounding how little has been written or published about Secret Service people – their lives, their history, and how life really looks to them. Cops are really good material for a journalist or a fiction writer. Cops see things most human beings never see. Even private security people have a lot to say for themselves. Computer-intrusion hackers and phone phreaks, by contrast, are pretty damned boring.

You know, I used to go looking for hackers, but I don't bother anymore. I don't have to. Hackers come looking for me these days. And they find me, because I make no particular effort to hide.

I also get a lot of calls from journalists. Journalists doing computer-crime stories. I've somehow acquired a reputation as a guy who knows something about computer crime and is willing to talk to journalists. And I do that, too. Because I have nothing to lose. Why shouldn't I talk to other journalists? They've got a boss; I don't. They've got a deadline; I don't. I know more or less what I'm talking about, they usually don't have a ghost of a clue.

Hackers will also talk to journalists. Hackers brag all the time. Computer cops, however, have not had a stellar record in their press relations. This is sad. I understand there's a genuine need for operational discretion and so forth, but since a lot of computer cops are experts in telecommunications, you'd think they'd come up with some neat trick to get around these limitations.

Let's consider, for instance, the Kevin Mitnick problem. The FBI tried to nab Kevin a few months back at a computer civil-liberties convention in Chicago and apprehended the wrong guy. That was pretty embarrassing, frankly. I was there. I saw it. I also saw the FBI trying to explain it all to about 500 enraged self-righteous liberals, and it was pretty sad. The local FBI officers came a cropper because they didn't really know what Kevin Mitnick looked like.

I don't know what Mitnick looks like either – even though I've written about him a little bit – and my question is, How come? How come there's no publicly accessible World Wide Web page with mug shots of wanted computer-crime fugitives? Even the US Postal Service has got *this* much together, and they don't even have modems. Why don't the FBI and the US Secret Service have public-relations stations in cyberspace? For that matter, why doesn't the High Technology Crime Investigation Association have its own Internet site? All the computer businesses have Internet sites now, unless they're totally out of it. Why aren't computer cops in much, much better rapport with the computer community through computer networks? You don't have to grant live interviews with every journalist in sight if you don't want to – I understand that can create a big mess sometimes. But just put some data up in public, for heaven's sake. Crime statistics. Wanted posters. Security advice. Antivirus programs, whatever. Stuff that will help the cyberspace community you are supposed to be protecting and serving.

How come there's no publicly accessible World Wide Web page with mug shots of wanted computer-crime fugitives? Even the US Postal Service has got *this* much together.

I know there are people in computer-law enforcement who are ready and willing and able to do this. But they can't make it happen because of too much bureaucracy and, frankly, too much useless hermetic secrecy. Computer cops ought to publicly walk the beat in cyberspace a lot more. Stop hiding your light under a bushel. What is your problem, exactly? Are you afraid somebody might find out that you exist?

This is an amazing oversight and a total no-brainer on your part, to be the cops in an information society and not be willing to get online big time and really push your information. Let me tell you about a few recent events in your milieu that I have no conceptual difficulties with. Case Number One: Some guy up around San Francisco is cloning off cell phones. He's burning EPROMs and pirating cellular IDs, and he's moved about a thousand of these hot phones to his running buddies in the mob in Singapore, and they've bought him a real nice sports car with the proceeds. The Secret Service shows up at the guy's house, catches him with his little soldering iron in hand, busts him, hauls him downtown, calls a press conference after the bust, says that this activity is a big prob-

lem for cell phone companies and they're gonna turn up the heat on people who do this stuff. I have no problem with this situation. I even take a certain grim satisfaction in it. Is this a crime? Yes. Is this a bad guy with evil intent? Yes. Is law enforcement performing its basic duty here? Yes. Do I mind if corporate private security is kinda pitching in behind the scene and protecting its own commercial interests here? No, not really. Is there some major civil-liberties and free-expression angle involved in this guy's ripping off cellular companies? No. Is there a threat to privacy here? Yeah – him, the perpetrator. Is the Secret Service emptily boasting and grandstanding when they hang this guy out to dry in public? No, this looks like legitimate deterrence to me, and if they want a little glory out of it – well, hell, we all want a little glory sometimes. We can't survive without a little glory. Take the dumb bastard away with my blessing.

OK, next case: some group of Vietnamese Triad types hijack a truckload of chips in Silicon Valley, then move the loot overseas to the Asian black market through some smuggling network that got bored with running heroin. Are these guys "Robin Hoods of the electronic frontier?" I don't think so. Am I all impressed because some warlord in the Golden Triangle may be getting free computation services, and information wants to be free? No. This doesn't strike me as a positive development, frankly. Is organized crime a menace to our society? Yeah! It is!

I can't say I've ever had much to do – knowingly that is – with wise-guy types, but I spent a little time in Moscow recently, and in Italy too at the height of the Tangentopoli kickback scandal, and, you know, organized crime and endemic corruption are very serious problems indeed. You get enough of that evil crap going on in your society, and it's like nobody can breathe. I never quite grasped how a protection racket worked and what it meant to victims till I spent a couple of weeks in Moscow in December 1993. That's a nasty piece of work, that stuff.

Another case: some joker gets a job at a long-distance provider and writes a PIN-trapping network program. He gets his mitts on about 8 zillion PINs and he sells them for a buck apiece to his hacker buddies all over the US and Europe. Do I think this is clever? Yeah, it's pretty ingenious. Do I think it's a crime? Yes, it's a criminal act. This guy is basically corrupt. Do I think free or cheap long distance is a good idea? Yeah, I do; if there was a very low flat rate on long distance, then you would see usage skyrocket so drastically that long-distance providers would make more money in the long run. I'd like to see them try that experiment sometime; I don't think the way they run phone companies today is the only way to run them successfully. Phone companies are probably gonna have to change their act if they expect to survive in the 21st century's media environment.

But, you know, that's not this guy's lookout. He's not the one to make that business decision. Theft is not an act of reform. He's abusing a position of trust as an employee in order to illegally line his own pockets. This guy is a crook.

So I have no problems with those recent law enforcement operations. I wish they'd gotten more publicity, and I'm kinda sorry I wasn't able to give them more publicity myself, but at least I've heard of them, and I was paying attention when they happened.

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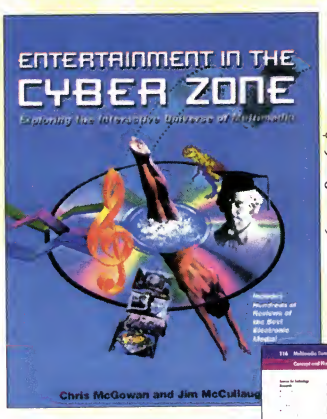

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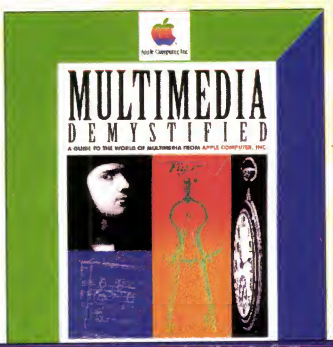

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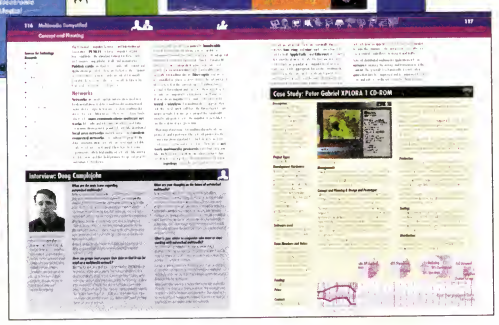

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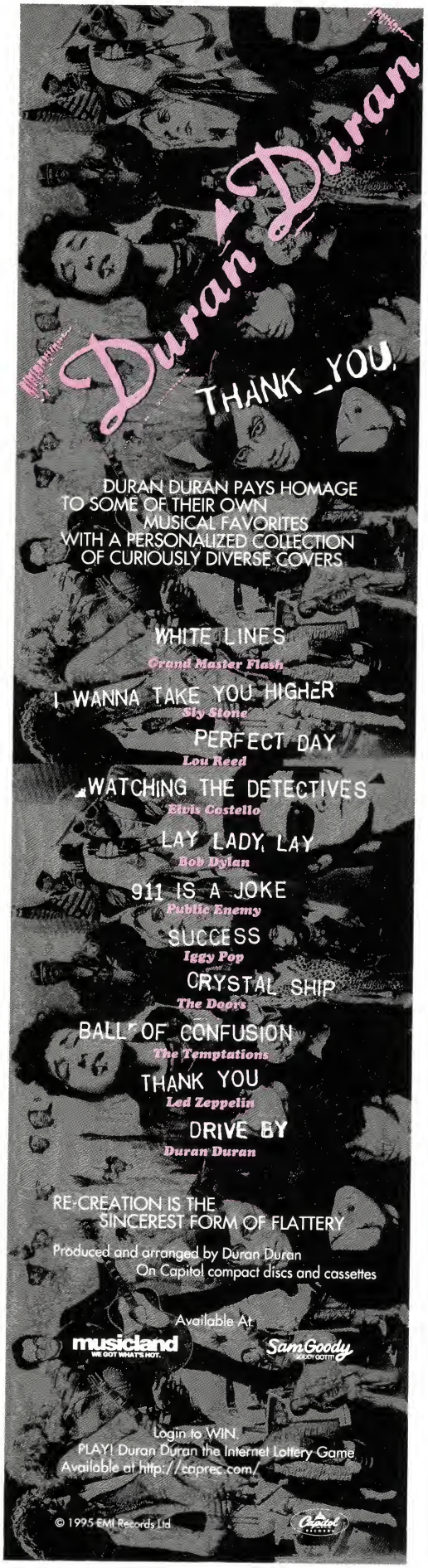


Now I want to talk about some stuff that bugs me. I'm an author and I'm interested in free expression. That's only natural because that's my bailiwick. Free expression is a problem for writers, and it's always been a problem, and it's probably always gonna be a problem. We in the West have these ancient and honored traditions of free speech and freedom of the press, and in the US we have this rather more up-to-date concept of "freedom of information." But even so, there is an enormous amount of "information" today that is highly problematic. Just because freedom of the press was in the Constitution didn't mean that people were able to stop thinking about what press freedom really means in real life, and fighting about it and suing each other about it. We Americans have lots of problems with our freedom of the press and our freedom of speech. Problems like libel and slander. Incitement to riot. Obscenity. Child pornography. Flag-burning. Cross-burning. Race-hate propaganda. Political correctness. Sexist language. Tipper. Gore's Parents Music Resource Council. Movie ratings. Plagiarism. Photocopying rights. A journalist's so-called right to protect sources. Fair-use doctrine. Lawyer-client confidentiality. Paid political announcements. Banning ads for liquor and cigarettes. The fairness doctrine for broadcasters. School textbook censors. National security. Military secrets. Industrial trade secrets. Arts funding for so-called obscenity. Even religious blasphemy such as Salman Rushdie's famous novel *Satanic Verses*, which is hated so violently by the kind of people who like to blow up the World Trade Center. All these huge problems about what people can say to each other, under what circumstances. And that's without computers and computer networks.

Every single one of those problems is applicable to cyberspace. Computers don't make any of these old free-expression problems go away; on the contrary, they intensify them, and they introduce a bunch of new problems. Problems like software piracy. Encryption. Wire fraud. Interstate transportation of stolen digital property. Free expression on privately owned networks. So-called "data-mining" to invade personal privacy. Employers spying on employee e-mail. Intellectual rights over electronic publications. Computer search-and-seizure practice. Legal liability for network crashes. Computer intrusion. And on and on and on. These are real problems. They're out there. They're out there now. In the future, they're only going to get worse. And there's going to be a bunch of new problems that nobody's even imagined.

I worry about these issues because people in positions like mine ought to worry about these issues. I can't say I've ever suffered much because of censorship, or through my government's objections to what I have to say. On the contrary, the current US government likes me so much it makes me nervous. But I've written 10 books, and I don't think I've ever written one that could have been legally published in its entirety 50 years ago. I'm 40 years old; I can remember when people didn't use the word condom in public. Nowadays, if you don't know what a condom is and how to use it, there's a pretty good chance you're gonna die. Standards change a lot. Culture changes a lot. The laws supposedly governing this behavior are gray and riddled with contradictions and compromises. There are some people who don't want our culture to change, or they want to change it even faster in a direction that they've got their own ideas about. When police get involved in a cultural struggle, it's always highly politicized. The chances of it ending well are not good.

There are some people who don't want our culture to change. When police get involved in a cultural struggle, it's always highly politicized. The chances of it ending well are not good.

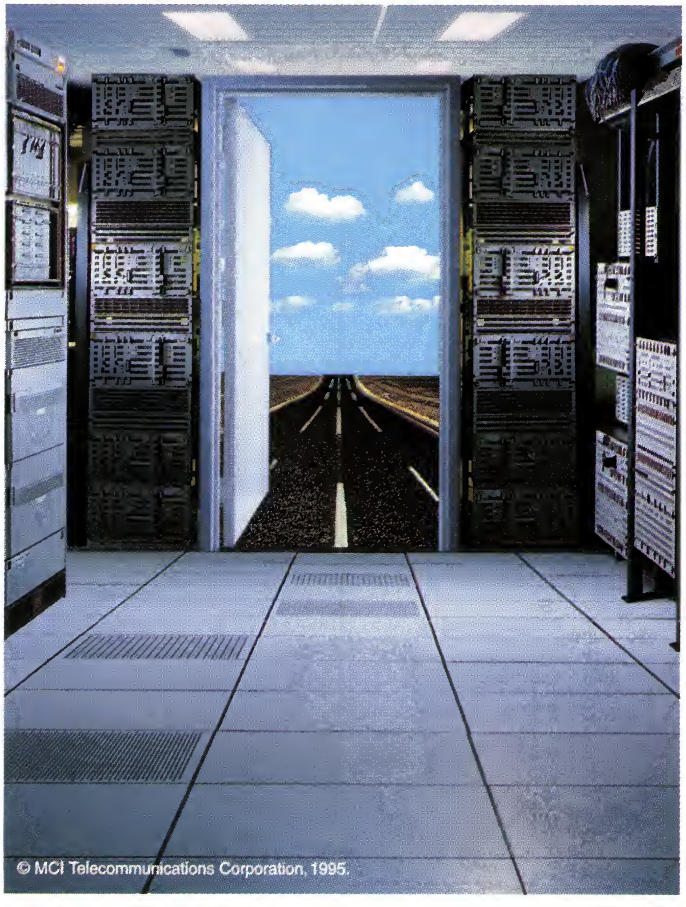
It's been quite a while since there was a really good, ripping computer-intrusion scandal in the news. Presumably, everyone was waiting for Kevin Mitnick to get really restless. Nowadays, the hot-button issue is porn. Kidporn and other porn. I don't have much sympathy for kidporn people; I think the exploitation of children is a vile and grotesque criminal act, but I've seen some computer porn cases lately that look pretty problematic and peculiar to me. There's not a lot to be gained by playing up the terrifying menace of porn on networks. Porn is just too treacherous an issue to be of much use to anybody. It's not a firm and dependable place in which to take a stand on how we ought to run our networks.

For instance, there's this Amateur Action case. We've got this couple in California, and they're selling some pretty seriously vile material off their bulletin board. They get indicted in Tennessee, and now face sentencing on 11 obscenity convictions, each carrying a maximum sentence of five years in prison and US$250,000 in fines. What is that about? Do we really think that people in Memphis can enforce their pornographic community standards on people in California? I'd be impressed if a prosecutor got a jury in California to indict and convict some pornographer in Tennessee. I'd figure that that Tennessee pornographer had to be pretty heavy-duty. Doing that in the other direction is like shooting fish in a barrel. There's something cheap about it. This doesn't smell like an airtight criminal case to me. This smells like someone from Tennessee trying to enforce the local cultural standards via a long-distance phone line. That may not be the truth about the case, but that's what the case looks like. It's hard to make a porn case look good at any time. If it's a weak case, then the prosecutor looks like a bluenosed goody-goody wimp. If it's a strong case, then the whole mess is so disgusting that nobody even wants to think about it or even look hard at the evidence. Porn is a no-win situation when it comes to the basic social purpose of instilling law and order on networks.

You could make a pretty good case in Tennessee that people in California are a bunch of flaky, perverted lunatics; in California, you can make a pretty good case that people from Tennessee are a bunch of hillbilly fundamentalist wackos. You start playing one community off another, and pretty soon you're out of the realm of criminal law, and into the realm of trying to control people's cultural behavior with a nightstick. There's not a lot to be gained by this fight. You may intimidate a few pornographers here and there, but you're also likely to seriously infuriate a bunch of bystanders. It's not a fight you can win – even if you win a case, or two cases, or ten cases. People in California are never gonna behave in a way that satisfies people in Tennessee. People in California have more money and more power and more influence than people living in Tennessee. People in California invented Hollywood and Silicon Valley, and people in Tennessee invented ways to put smut labels on rock-and-roll albums.

This is what Pat Buchanan and Newt Gingrich are talking about when they talk about cultural war in America. If I were a cop, I would be very careful of looking like a pawn in some cultural warfare by ambitious radical politicians. The country's infested with zealots now – to the left and right. A lot of these people are fanatics motivated by fear and anger, and they don't care two pins about public order or the people who maintain it and keep the peace in our society. They don't want a debate. They just want to crush their enemies by whatever means possible. If they can use cops to do it, then great! Cops are expendable.

There's another porn case that bugs me even more. There's this guy in Oklahoma City who had a big fidonet bulletin board, and a storefront where he sold CD-ROMs. Some of them, a few, were porn CD-ROMs. The Oklahoma City police catch this local hacker kid, and of course he squeals – they always do – and he says, Don't nail me, nail this other guy, he's a pornographer. So off the police go to raid this guy's place of business, and while they're at it, they carry some minicams and



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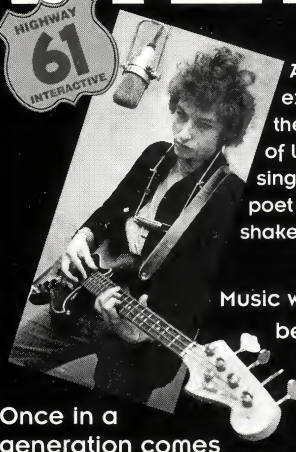

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they broadcast their raid on that night's Oklahoma City evening news (this is in August of '93). It was a really high-tech and innovative thing to do, but it was also a really reckless cowboy thing to do, because it left no political fallback position. They were now utterly committed to crucifying this guy, because otherwise it was too much of a political embarrassment. They couldn't just shrug and say, Well, we've just busted this guy for selling a few lousy CD-ROMs that anybody in the country can mail order with impunity out of the back of a computer magazine. They had to assemble a jury, with a couple of fundamentalist ministers on it, and show the most rancid graphic image files to the 12 good people. And, sure enough, it was judged in a court to be pornographic. I don't think there was much doubt that it was pornography, and I don't doubt that any jury in Oklahoma City would have called it pornography by the local Oklahoma City community standards. This guy got convicted. Lost the trial. Lost his business. Went to jail. His wife sued for divorce. He's a convict. His life is in ruins.

I don't think this guy was a pornographer by any genuine definition. He had no previous convictions. Never been in trouble. Didn't have a bad character. Had an honorable war record in Vietnam. Paid his taxes. People who knew him personally spoke very highly of him. He wasn't some loony sleazebag. He was just a guy selling disks that other people (just like him) sell all over the country, without anyone blinking an eye. As far as I can figure, the Oklahoma City police and an Oklahoma prosecutor skinned this guy and nailed his hide to the side of a barn, just because they didn't want to look bad. A serious injustice was done here.

It was a terrible public relations move. There's a magazine out called *Boardwatch* – practically everybody who runs a bulletin board system in this country reads it. When the editor of this magazine heard about the outcome of this case, he basically went nonlinear. He wrote this scorching furious editorial berating the authorities. The Oklahoma City prosecutor sent his little message all right, and it went over the Oklahoma City evening news, and probably made him look pretty good, locally and personally. But this magazine sent a much bigger and much angrier message, which went all over the country to a perfect target computer-industry audience of BBS sysops. This editor's message was that the Oklahoma City police are a bunch of crazed no-neck Gestapo who don't know nothing about nothing, and hate anybody who does. I think that the genuine cause of computer law and order was very much harmed by this case.

There are a couple of useful lessons to be learned here. The first, of course, is don't sell porn in Oklahoma City. And the second is, if your city's on an antiporn crusade and you're a cop, it's a good idea to drop by the local porn outlets and openly tell the merchants that porn is illegal. Tell them straight out that you know they have some porn, and they'd better knock it off. If they've got any sense, they'll take this word from the wise and stop breaking the local community standards forthwith. If they go on doing it, well, presumably they're hardened porn merchants of some kind, and when they get into trouble with ambitious local prosecutors, they'll have no one to blame but themselves. Don't jump in headfirst with an agenda and a videocam. It's real easy to wade hip deep into a blaze of publicity, but it's real hard to wade back out without getting the sticky stuff all over you.

Don't jump in headfirst with an agenda and a videocam. It's real easy to wade hip deep into a blaze of publicity, but it's real hard to wade back out without getting the sticky stuff all over you.

It's generally a thankless lot being an American computer cop. You know this; I know this. I even regret having to bring these matters up, though I feel that I ought to, given the circumstances. I do, however, see one small ray of light in the American computer-law enforcement scene, and that is the behavior of computer cops in other countries. American computer cops have had to suffer under the spotlight because they were the first people in the world doing this sort of activity. But now, we're starting to see other law enforcement people in other countries. To judge by early indications, the situation's going to be a lot worse overseas.

Italy, for instance. The Italian finance police recently decided that everybody on fidonet was a software pirate, so they went out and seized somewhere between 50 and

100 bulletin boards. Accounts are confused, not least because most of the accounts are in Italian. Nothing much has appeared in the way of charges or convictions, and there's been a lot of anguished squalling from deeply alienated and radicalized Italian computer people. Italy is a country where entire political parties have been annihilated because of endemic corruption and bribery scandals. A country where organized crime shoots judges and blows up churches with car bombs. In Italy, politics is so weird that the Italian Communist Party has a national reputation as the party of honest government.

The hell of it is, in the long run I think the Italians are going to turn out to be one of the better countries at handling computer crime. Wait till we start hearing from the Poles, the Romanians, the Chinese, the Serbs, the Turks, the Pakistanis, the Saudis.

Here in America we're getting used to this stuff, a little bit. We have a White House with its own Internet address and its own World Wide Web page. American law enforcement agencies are increasingly equipped with a clue. In Europe, you have computers all over the place, but they are imbedded in a patchwork of PTTs and peculiar local jurisdictions and even more peculiar and archaic local laws. In a few more years, American cops are going to earn a global reputation as being very much on top of this stuff.

As for the computer crime scene, it's pretty likely that American computer crime is going to look relatively low-key, compared to the eventual rise of ex-Soviet computer crime, and Eastern European computer crime, and Southeast Asian computer crime.

Since I'm a science fiction writer, I like to speculate about the future. American computer police are going to have a hard row to hoe, because they are almost always going to be the first in the world to catch hell from these issues. Certain bad things are naturally going to happen here first, because we're the people who are inventing almost all the possibilities. But I also feel that it's not very likely that bad things will reach that extremity of awfulness here. It's quite possible that American computer police will make some awful mistakes, but I can almost guarantee that other people's police will make worse mistakes by an order of magnitude. American police may hit people with sticks, but other people's police are going to hit people with axes and cattle prods. Computers will probably help people manage better in those countries where people can manage. In countries that are falling apart, overcrowded countries with degraded environments and deep social problems, computers might well make things fall apart even faster.

Countries that have offshore money laundries are gonna have offshore data laundries. Countries that now have lousy oppressive governments and smart, determined terrorist revolutionaries are gonna have lousy oppressive governments and smart determined terrorist revolutionaries with computers. Not too long after that, they're going to have tyrannical revolutionary governments run by zealots with computers; then we're likely to see just how close to Big Brother a government can really get. Dealing with these people is going to be a big problem for us. ■ ■ ■

Bruce Sterling (bruces@well.sf.ca.us) *is the author of five science fiction novels, the nonfiction work* The Hacker Crackdown, *and co-author, with William Gibson, of* The Difference Engine.

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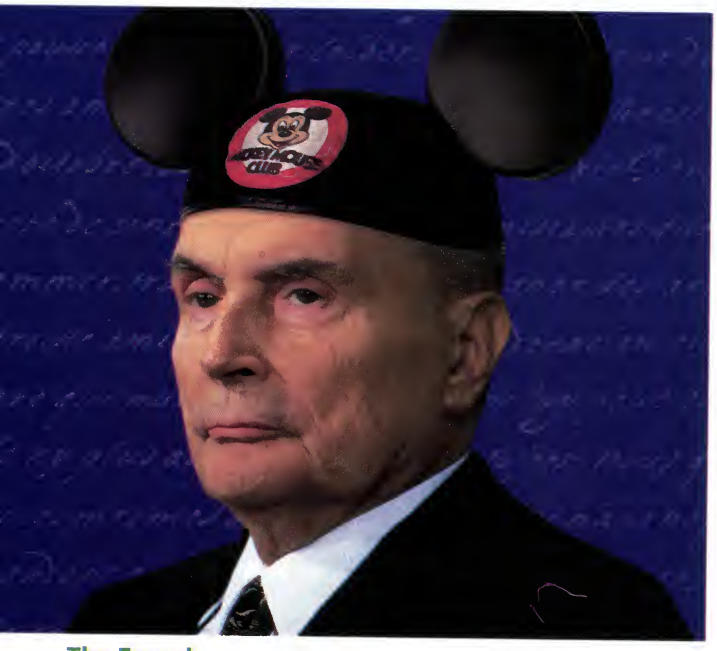
Culture Wars

François Mitterrand has declared war on Mickey, Madonna, and all-American culture. Bad news, François: Mickey's winning. John Andrews reports from the front line.



The French believe the élite has a moral duty to preserve the country's culture. But the most popular films in France are *Forrest Gump* and *Pulp Fiction*.

François Mitterrand, 78 years old and stricken with cancer, can still play to the gallery. "Europe," declared France's president on a swan-song visit in January to the European Parliament in Strasbourg, France, "must be more than economic balance sheets and tons of freight. I would say, but I don't want to exaggerate, that it needs a soul.... Europeans," he concluded, "must love Europe."

But a stroll through Paris, city of romance, suggests that all is not well with this love affair. The films in Montparnasse and on the Champs Elysées are American – *Pulp Fiction, Forrest Gump, Mrs. Doubtfire* – and the hamburgers are McDonald's. Turn to television and *Magnum* springs to action, the Selleck mustache not quite in time with the French-dubbed soundtrack. Switch to Radio Nostalgie and the songs are by Elvis and the Beach Boys. "Cool" is the cool word among French youth, and the coolest also say "fuck" – a habit picked up from *Pulp Fiction*. Even newscasters are succumbing to the lure of the American – describing last year's LA earthquake as "*pas le Big One*."

France's patriarchs are outraged. Europeans' love affair with Europe is threatened by this cultural flirtation with the Americans, and they are determined to put a stop to it – single-handedly if necessary, but with the full weight of the European Union behind them if possible. France's preferred weapon against the cultural invaders of Paramount, CNN, and MTV is quotas. Anything non-European must be strictly rationed. The majority of what appears on television and radio must be European – preferably, French. As for cinema, the French already have a levy on the ticket price, and plow the money straight back into French movie productions.

Slowly, but so far steadily, the French are maneuvering the European Commission into tightening restrictions on imports of American – or as they put it, non-European (but nobody is in any doubt as to whom the proposed laws are aimed at) – films, television shows, and music. And the hype over interactive television, video-on-demand, and music delivered over the Internet, only strengthens the French resolve. If they do not take a stand now, they reckon, it will soon be too late. But, on the contrary, it's too late already for the sorts of measures the French have in mind.

In an age of interactive media, cultural quotas will prove at least as self-defeating – and if anything, useless – as the Maginot Line, France's last great attempt to wall itself off from invaders. This "impenetrable" wall of fortifications was designed after World War I to prevent the Germans from ever again marching across French soil. What its designers forgot, however, was that the new technology of tanks and airplanes rendered fixed fortifications obsolete. Invaders simply went around the forts at high speed. The Maginot Line lasted only a few weeks at the opening of World War II, and, with its false security punctured, France collapsed.

New technology also mocks the quotas the French use to try to defend themselves against American firms. In sober moments, some of them would admit this is true. But the temptation for the French – and even for many other Europeans – to do something, anything, about the Americans now seems too strong to resist. Electronic communication has bred new familiarity, and familiarity is breeding contempt.

France stands at the opposite end of the spectrum from America on a variety of issues. Once a global power, it is now merely another medium-sized nation. Molière is no longer as famous as Shakespeare. French is no longer the language of diplomacy; English is. And even its former colonies teach English in schools – to children who listen to American rock, drink Coca-Cola, and eat hamburgers.

Unlike Americans, who see the highest morality in allowing individuals to choose whatever they wish to do – however stupid it may appear to others – the French believe, more than most Europeans, that the élite has a moral duty to lead the masses. Economically, this is the land of Jean Baptiste Colbert, central financial planner to Louis XIV, not Adam Smith and the "invisible hand of the marketplace." For example, take a peek at a 1993 interview given to the *Financial Times* by Edouard Balladur, prime minister of France and now the favorite to succeed Mitterrand in this spring's presidential election. "What is the market?" asked Balladur. "It is the law of the jungle.

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And what is civilization? It is the struggle against nature."

Culturally, France is the land of the Académie Française, which strives, albeit with partial success, to dictate the form of the language and to define the heights of culture. It is probably the only nation in the world in which a group of intellectuals talking about books can command near-prime time television. So, to hell with Mickey Kantor, Mickey Mouse, and all other Americans. *Ils ne passeront pas.* France is not about to agree to free trade in "audiovisual" products. Instead, it intends to protect its cultural heritage, and in the process also the patrimony of other Europeans, less alert than France to the incoming tide of transatlantic banality.

Of course, France's cultural outrage is all the stronger for being buttressed by a deeper layer of economic self-interest. Culture – films, television, music, computer games – is big business, and the business will get bigger with every digitizing leap of technology, and with every telephone or computer or cable company that decides to step outside its traditional boundaries.

To hell with Mickey Kantor, Mickey Mouse, and all other Americans. France's cultural outrage is all the stronger for being buttressed by a deeper layer of economic self-interest.

When experts for the European Commission, the European Union's executive body, did their sums last year, they reckoned Europe's audiovisual sector to be worth some US$325 billion, with software sales accounting for just over half the global total. More to the point, the sector supposedly employs 1.8 million "in software alone" – and the number could grow to 4 million, directly or indirectly, "if we devote the necessary efforts to it." With one tenth of Europe (17 million people) now jobless, it is no wonder that Eurocrats are tempted to take extraordinary measures to grab those jobs.

True, these are extremely self-interested calculations, and the Hollywood lobby scoffs at the arithmetic. (As do Europe's assorted computer and software companies. Even using the broadest definition, can software really employ more people than an automobile industry dominated by giants like Volkswagen, Renault, and Fiat?) But it does not take heroic calculations to come up with enough to worry the French. Take the economic balance sheet dismissed by Mitterrand. Of America's audiovisual exports, from films to CD-ROMs and computer games, some 60 percent are sold to Europe. Since precious little gets sold back to Americans, the result for Europe is a whopping deficit: $3.6 billion in 1992, a tenfold increase in less than a decade.

Part of the evidence is in virtually every movie house in Western Europe. At the end of the 1960s, American films took one-third of the box office in Europe. By the end of the 1970s, the share was almost one half. Now, the figure's up to 80 percent, and even France, fighting hard to buck the trend, last year saw takings for its own films dip below 30 percent for the first time. And Europe's exports to the United States? Even with such hits as *Chariots of Fire* and *Four Weddings and a Funeral* (both of them, the French will note, English-language movies), European films usually take a miserable 1 percent of the American box office.

The figures are depressing from every angle. Europe's regular cinema audiences – the kind who still consider Saturday night movie night – are a shrinking breed, down over the past 15 years from 1.2 billion to 550 million. But that decline has affected only European films; the audience watching the American imports has remained stable, and presumably satisfied, at around 450 million. Whichever way you cut the figures, Europe loves American films and American stars. Gérard Depardieu may be the darling of French cinema, but he will never match the European or the global audience of Bruce Willis or Sylvester Stallone.

Things are worse at the top. In 1975, nine of the ten highest-earning films in France were French and only one was American. Compare that with the 1992 list: seven American, one British, and just two French titles. Or 1991, when the top 10 were all American. True, last year marked something of a comeback for the nationalists: five French films attracted audiences of more than 2 million each. But the top three in France were all foreign – Disney's *The Lion King*, England's *Four Weddings and a Funeral* (ah, perfidious Albion...) and *Mrs. Doubtfire*.

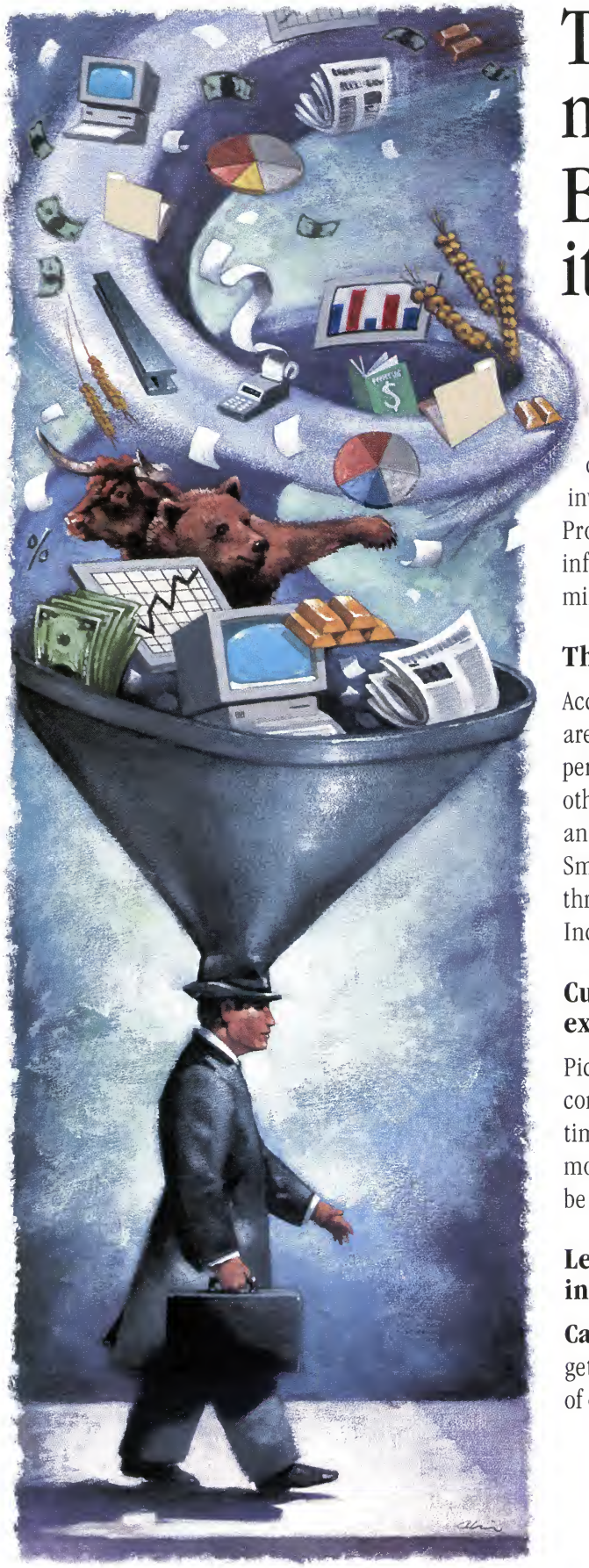
Given those sorts of statistics, even the sensible French people have come to worry that, if current trends continue unchecked, no European cinema will bother to show a Depardieu movie – so no producer will bother to spend the time and money to make one (not least because dominant cinema chains, like Warner Bros., are the offspring of the American production houses).

Unfortunately, even the sensible French people seem to have jumped straight from an understandable worry into self-defeating panic. The reason Mitterrand has taken to lecturing European parliamentarians on the need to defend Europe's culture is that France, for the first half of this year, has the rotating presidency of the European Union. So the French government sets the agenda for joint action by all 15 EU member states. High on the French agenda is a revision of a 1989 EU directive somewhat ironically known as Television Without Frontiers, which lays down the law for the member states on trade in audiovisual goods.

What the directive says is simple enough in its essence: member states shall "reserve for European works ... a majority proportion of their transmission time" and will "reserve at least 10 percent of their transmission time ... or alternately, at least 10 percent of their programming budget, for European works created by producers who are independent of broadcasters."

Reading between the lines is just as easy. Television companies create and deliver mass culture; they are also the biggest single buyers of movies. If they are left to themselves and to the forces of the free market, they tend to buy American. For two reasons. First, Hollywood is the world's greatest star-making machine, and is the source of most of the names people recognize and the media brands they want to buy. Second, and not unrelated, America is the world's largest media market: it can export films, television shows, and other media products to the rest of the world at very low prices. Having recovered their costs (and probably made a profit) in America, any extra revenue studios can garner from exports is pure cream. So European program makers – and the zealots would claim, European culture – will survive only if they are guaranteed a share of the market, including a special requirement for the big TV companies to buy their programming from the small independents (or so the protectionists argue).

Jacques Toubon, France's culture minister, claims that without quotas and other regula-



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tions, the number of European programs shown on TF1, France's most popular television channel, would dramatically drop from 4,000 a year to 600. Certainly, there is no shortage of regulations – for France has gone well beyond the minimum laid down in the original Television Without Frontiers directive. France insists on 60 percent European programming on its television, rather than a simple majority as is specified in the directive, half of which must be in French. Television cannot show films on Wednesday evenings, when movie theaters present new releases. Nor can TV show films during prime-time hours on the traditional movie-going nights of Friday and Saturday. Moreover, each television channel can show an average of only two films a week.

American banalities. French TV is full of soaps that make *Dynasty* look like Shakespeare. It boasts a French music channel called MCM (which is a rather good copy of MTV), and it broadcasts a subsidized news channel called Euronews – a vain attempt to compete with CNN.

In his determination to block Europe's gates to any audiovisual or cultural *cheval de Troie*, Toubon doesn't seem to have asked himself which is the more powerful force of cultural infiltration: an original American program, or a Frenchified copy of similar ideas and characters. According to the law, what makes a film or program French, or European, is simply where the film is shot – not where the ideas come from. And Toubon and his allies are determined to keep the

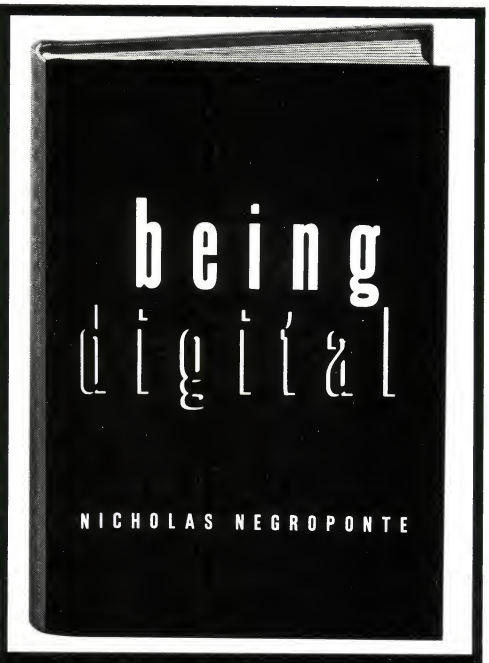
France insists on 60 percent European programming on its television, and television cannot show films on Wednesday nights, when theaters present new releases.

Television channels must also invest the equivalent of 15 percent of turnover into French fiction, documentaries, or animation; the equivalent of 3 percent of turnover must be spent on domestic film production. Canal+, France's "deregulated" pay television station, is required to invest 20 percent of turnover in new films, half of which must be in French. Although the French courts recently overthrew (as unconstitutional) a law that would have forced private-sector TV stations to eschew borrowed English words – *le weekend, le meeting, le leader,* and so on – that are sprinkled through every newscast, there is a law that will soon require the country's eight FM radio networks to increase the French content of their music to a minimum of 40 percent, half of which is to come from "new French talent."

No wonder that Jeanne Moreau, François Truffaut's star and collaborator, recently complained to *Newsweek* that the new generation of French directors is more interested in bureaucratic maneuvering for subsidies than wooing audiences with art. Subsidies are where the easy money is. But a larger problem, and one that threatens to ridicule Toubon's claims for the usefulness of subsidies, is that the French programming requirements seem to be outstripping French creativity. To meet their quotas, subsidized French producers are expensively re-creating European cameras rolling by keeping the products of American ones out.

France must be taken seriously in its determination to produce a "better" version of the Television Without Frontiers directive. Some sort of revision is required, because the law demands reconsideration now that it is five years old. While some Europeans might argue that, because the directive has failed, it should be scrapped, the French culturecrats reply that if it has failed, it shouldn't be scrapped but improved. Presidency of the European Union now gives the French the political clout to make these improvements – which they will no doubt pursue with the same aggressive, hard-headed negotiating tactics they used two years ago, in the closing days of the Uruguay round of trade talks under the General Agreement on Tariffs and Trade.

Mickey Kantor, negotiating on behalf of the US, was then adamant that Europe must stop its cultural protectionism; Sir Leon Brittan, his EU counterpart (and, in French eyes, an untrustworthy Brit), was sympathetic; and Jack Valenti, president of the Motion Picture Association of America, wheeled into action the Hollywood lobby. Was France really ready to prevent the best agreement on free trade that had ever been dangled before the world, merely to restrict America's access to European screens? We shall never know. In the standoff, first France's EU partners blinked,



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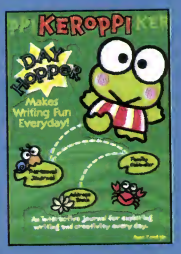

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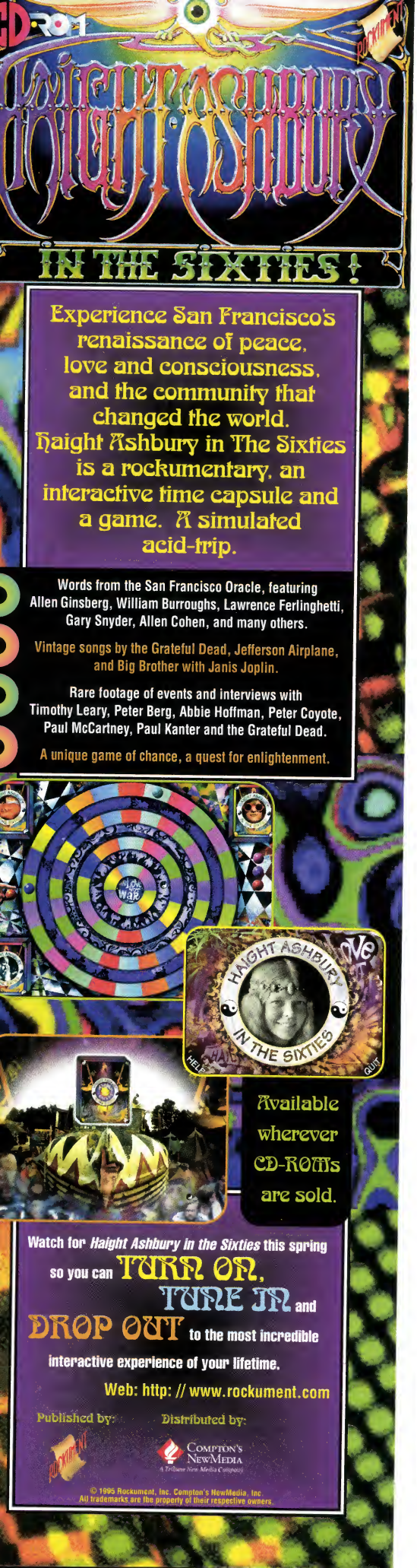

and then the Americans did. France got what it wanted: a "cultural exception" – the exclusion of any audiovisual trade from the rules of the GATT and its new successor, the World Trade Organization.

The British are, not surprisingly, the freest cultural traders. Not only is their government by instinct laissez-faire, but most of the cultural imports that worry the French are in English – which can hardly arouse the same suspicions in England as in France. The Belgians care passionately about language, but are themselves divided among Dutch- and French-speaking inhabitants – and so, quite literally, do not speak with a single voice to the rest of Europe. Germans are increasingly irked that the rest of Europe insists on learning English (83 percent of the EU's high-school students learn English as a second language, only 32 percent learn French, and 16 percent German). But like Italy, Germany is a relatively new nation, not much more than a century old. Regional cultures and loyalties still tug harder at German and Italian hearts than national ones, leaving them instinctively pluralistic.

Will the French take defense of their language to the point of jamming German-language stations broadcast from shared satellites? Now, that would be a step toward European unity.

Were television broadcasts the only issue at stake, France might well find itself standing vainly alone against the American invaders. But there is still a second strand to Europe's cultural unease – new technology, which is all the more worrying because it is all the more unknown. In optimistic moments, liberal Europeans gush about technology's potential for crashing across cultural and national boundaries, leaving a fresh wind of democracy and new ideas in its wake. But those benefits are of course for other, less enlightened peoples. Among enlightened Europeans, the fear is that new ideas will inevitably be bad ones – not just banal American soap operas and brainless game shows but also alt.sex along with (heaven help us) its interactive video equivalent. The prospect of *lycées* and *hochschulen* full of fresh-faced Euro-adolescents devoting their leisure hours to the pursuit of international "relations" makes even those normally cautious Eurocrats wonder if perhaps some safety precautions might quietly be slipped into place.

So the Commission's relevant Eurocrats (most of whom, you may already have guessed, are interventionist French) also quietly propose to extend trade "safeguards" for new technologies, such as video-on-demand. The original 1989 directive simply ignored new technologies: today's proposed revisions exclude them from regulation. Online services and "personal communications," such as the vast majority of Internet traffic, have never been included in the quota system. Drafts of the proposed revisions also state that quotas "shall not apply" to local broadcasts (such as "ethnic" stations) nor to "communication services that operate only on individual demand" – jargon one assumes for video-on-demand and pay-per-view.

But in Euro-regulation, practice and principle can, and sometimes do, quietly diverge. While there are no production quotas on interactive video, a clause already in the 1989 directive allows any member state to "lay down more detailed or stricter rules in particular on the basis of language criteria." Apply this clause to new technologies – to video-on-demand or to the rapidly blurring boundary between (unregulated) personal communications and (regulated) video entertainment – and all sorts of interesting things happen. Most of them are absolutely outrageous, absurd, or both.

To what does a quota apply in an individualized, demand-driven system? Everything in the database? (Even if some of it is never viewed?) Or each individual's viewing patterns? Even long-suffering Euro-consumers might start to complain if they are denied the film of their choice from their new video-on-demand system because they have already exceeded the week's quota of foreign films.

And it does not take video-on-demand, development of which is still some years off, to make regulations look silly. One force driving France to embark on its "cultural offensive" is its fear of being outflanked by the growth of European TV – from about 100 channels now to probably 500 by the end of the century. But many of those channels will be delivered by direct-broadcast satellite, whose reception footprint is confined by the

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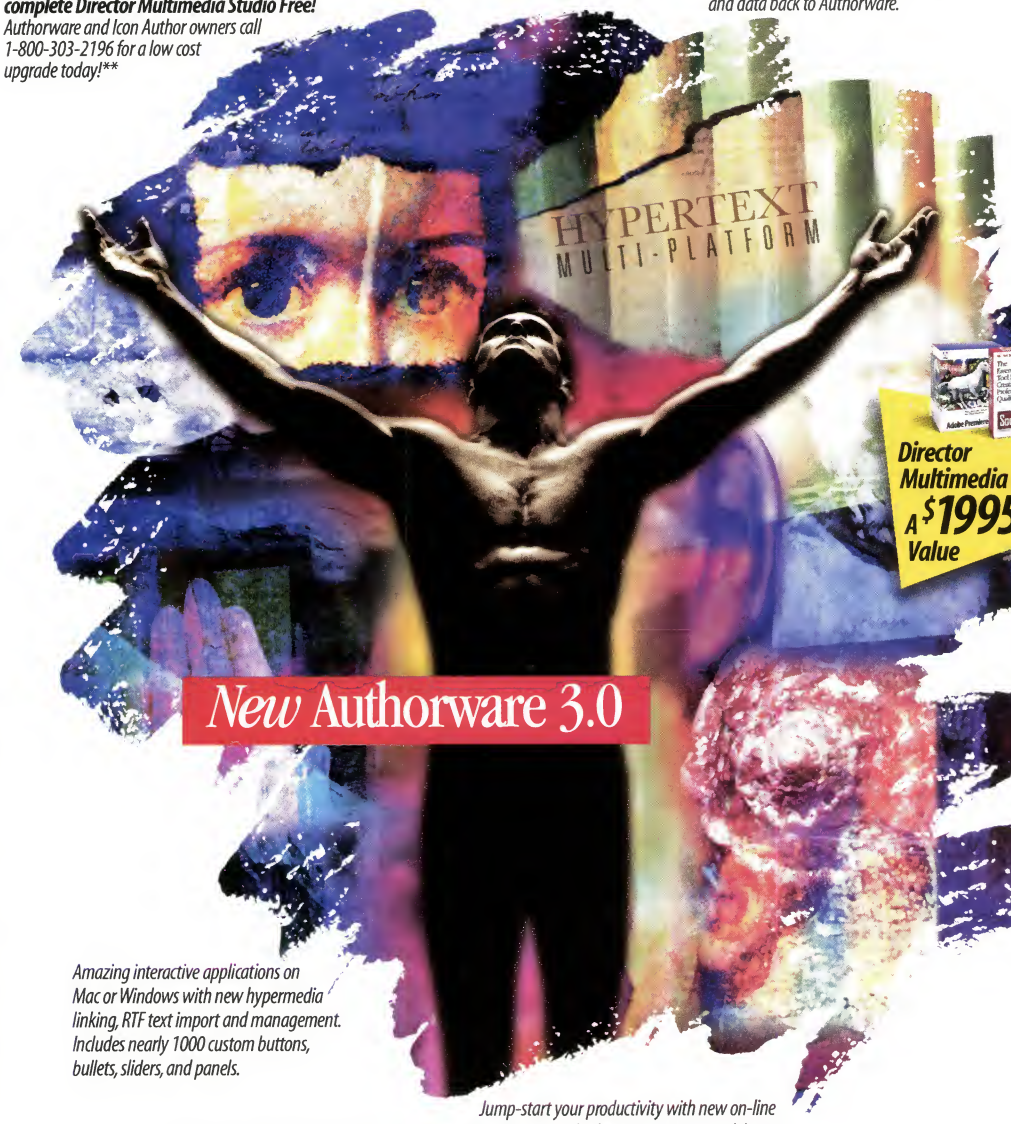

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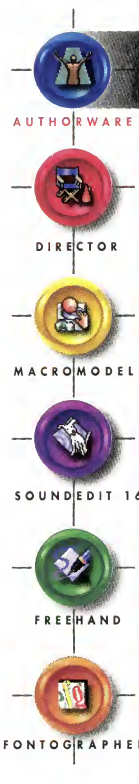

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laws of physics rather than national boundaries. So, will the French take defense of their language to the point of jamming German-language stations broadcast from shared satellites? Now, that would be a step toward European unity.

The enforcement of cultural quotas on the explosive growth of new technologies could succeed only through authoritarian supervisors – "thought police" – tuned to every satellite dish, monitoring every signal plucked from the air or whizzed down an optic fiber. Technically, the authorities might be able to control every European-based program provider. But could they really monitor all transmissions from outside, even if they wanted to? And *do* they want to? While defense of culture is politically popular in Europe for now, even the French might pause when they realize that the staunch defense of European values in the face of changing technology also requires monitoring and censorship on a scale now practiced only in North Korea and Singapore.

But it is unlikely to come to that. Talk of a compromise, driven by economic self-interest rather than cultural chauvinism, is already circulating through the political corridors of Brussels. In the GATT negotiations of 1993, Valenti, the short-but-strident icon of the American film industry, was breathing fire against Europe. Now he preaches reconciliation: "The way to the future is cooperation, not controversy nor a collision with reality. The American movie and TV community wants to reach out to its European colleagues in a spirit of cooperation."

Valenti means that Hollywood will provide the Europeans with help in making films that more Americans (as well as Europeans) want to watch: better dubbing techniques, help with scriptwriting, perhaps some marketing expertise, and maybe better access to American-controlled distribution networks both in the US and Europe. At the same time, American media companies are investing in Europe, even in France – witness the recent decision by Time Warner Inc. to enter into a co-production agreement with state-owned France Television.

So, at the end of the day, will all the quotas and cultural arm-twisting have been worth it? The French are likely to declare victory no matter what happens. But at best it will be a hollow one. A nation's soul cannot be manufactured by regulatory fiat. And a nation's culture, the expression of its soul, cannot be preserved in a regulatory museum; it must evolve. There will always be subsidies for the arts – from state support for opera in Britain to tax incentives for film production in Ireland. But to set quotas is to stifle the conversations and the evolution that keeps culture alive. French TV soaps with their guaranteed market share are no better than the American ones, while good French pop groups, like Les Negresses Vertes, don't need any state-guaranteed FM air time.

What is at risk in the arguments over culture is France's – and Europe's – stake in the future. Any culture or nation that does not come to grips with technology is living in the past.

The irony, of course, is that if any culture can be said to be under threat from foreign ideas, it certainly isn't France's. The French language will no more weaken just because it incorporates *le weekend* than English has been weakened by using words like sang-froid; nor will French cuisine disappear because there is a McDonald's in every town. (Quite the contrary.)

What is at risk in the arguments over culture, however, is France's – and Europe's – stake in the future. Any culture or nation that does not come to grips with the technologies changing our lives is, quite literally, living in the past. While the French argue over the culture of communications, they inevitably discourage investment. Who is going to invest in building an "information superhighway" if they do not know what traffic it will be allowed to carry? Europe is already behind in joining the new technological world. One of the key steps, complete liberalization of all telecommunications, has stupidly been allowed to wait until 1998. If Europe falls even further behind on that highway, it will no longer have to worry about its cultures, for it will have effectively put them all in a museum. As Molière once said: "Nearly all men die of their remedies, and not of their illnesses." ■ ■ ■

John Andrews is The Economist*'s correspondent in Brussels.*

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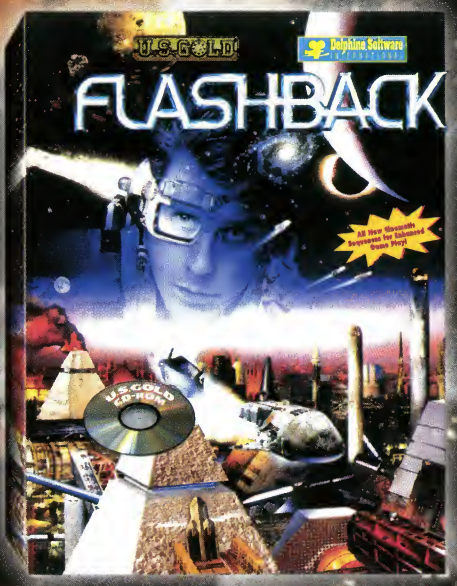

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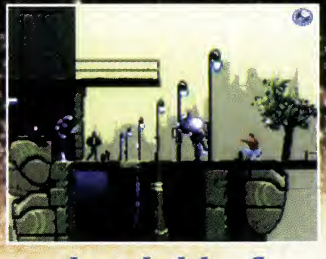

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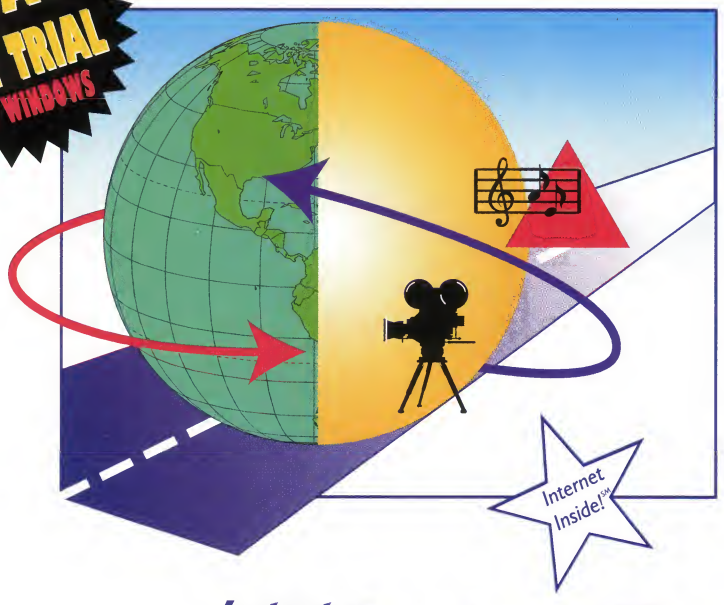

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Net Access for Next to Nothing

By Sandy Sandfort and Duncan Frissell

The big lie of universal access subsidies.

One argument for subsidized universal access goes like this: Net access is prohibitively expensive. If nothing is done, we will be divided into permanently warring classes of information haves and have-nots. The only solution to this market failure is government intervention.

The linchpin to this position is the cost. Is the price of getting on the Net really "prohibitively expensive"? We don't think so. We know it doesn't have to cost the three to four grand everyone's throwing around. In fact, we know you can get online for less than the cost of buying *The New York Times* daily. That's right – you can get a computer, modem, software, and your first year of Net access for less than US$520 – the annual newsstand cost of the national edition of *The Times*. And after the first year – unlike with *The Times* – your Net access costs go down. You can even get online for free.

Computers are like kids' toys: they aren't worn out, they are outgrown. They get replaced by something bigger, better, and faster. And when they are, prices for older models head for the basement – the bargain basement.

So what if you can't afford a 100-MHz Pentium box with a PCI local bus, a 1-Gbyte hard drive, and a V.34 modem? That doesn't mean you can't surf the Net. It's not a question of money; it's a question of desire.

Telecommunications is still a relatively low-tech affair. Once you leave the inside of your superbox and go out on the wires, things slow down to the speed of the first personal computers. If you want to get online, all you need is any piece of hardware that can emulate a VT-100 terminal. Connect it to a hot Unix box and you're moving at warp speed.

Here's what you can do for $208: get a used XT with two floppy drives for $70; a 2400-baud internal modem (new at a local computer show) for $18 (it comes with free communications software); and an e-mail and Usenet news-reading account for $10 per month.

What can you do with an e-mail and news account? Just about everything. Aside from reading the daily gigabytes of Usenet, you can use various e-mail servers to do Archie searches and grab files from ftp sites. Almost every Net service can be accessed by mail if you can figure out how.

If that's too expensive, you can settle for a Commodore 64, which costs maybe $20. Add a black-and-white TV for under $10 and a 300-baud modem for $5 or less.

Of course, you might not have to pay anything if you can get Net access through a college or your job.

There you have it – Net access on a shoestring. It's obvious that the real barriers to getting online are not financial; we would argue that they aren't even intellectual. The real problem is that most people don't yet know they want to be wired. That barrier can be overcome only by good marketing that turns the Net into something everyone has to have. We won't get that from the government.

Sandy Sandfort is a writer, cypherpunk, and outlawyer specializing in privacy issues. Duncan Frissell is an attorney and privacy consultant. He writes and speaks about the political and social effects of communications technology.

Addressing the Future of the Net

By Steve G. Steinberg

What to do as the Internet runs out of handles.

The Internet may be the most successful example of anarchy ever known. Built by hackers instead of corporations, governed more by myths than by rules, the Net seems to bypass authority at every turn.

But the exponential growth in users and the mounting commercial presence are taxing the structures and policies that make up the Net. It's time for law and order, say politicians and corporate execs. The Net is no longer just for kids.

The friction between anarchy and bureaucracy has made itself known in a growing number of Net flames and political debates and, perhaps most clearly, from the Net's evolving technology. We like to think that technology is separate from politics. Of course it's not: the technology of the Net not only reflects, but fully embodies, the politics of the Net.

The story of the Net's first technical crisis – the battle over the Internet Protocol (IP) – offers valuable clues to who controls the Net and where it's headed. Most importantly, this episode points toward the need for significant changes in how policy issues are decided if the Internet is to maintain its technical preeminence.

Underneath e-mail, the World Wide Web, and every other Internet application lies IP – the native language of the Internet. Internet Protocol is a set of rules defining how information is sent from one computer to another. Information is divided into chunks, and each chunk is put into a digital envelope that says where it should go. The envelopes are addressed with a string of 32 ones and zeros that uniquely identifies the destination computer.

These 32 bits allow for many billions of computers to be named, a number that seemed excessive around the time IP was designed. But huge blocks of addresses were freely given out to companies and universities, and the popularity of the Internet grew faster than anyone could have imagined.

By 1991, Internet gurus were confronted with a brewing crisis: the Internet was running out of addresses. It was as if a global telephone company discovered that almost every possible phone number had been taken.

Sure, IP could be changed so that addresses were longer,

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say 64 or 128 bits, but the repercussions would affect every piece of network hardware – this was not a change to be made readily. Besides, IP was showing its age in other ways. It had been designed in the late '60s, before people used portable computers or sent video over the Net. If IP was going to be modified, why not also update it for the '90s? And beneath the question of what the next generation of IP should look like lay an even greater one: Who decides?

There is an acronym soup of committees nominally "in charge" of the Internet. But their powers are suspect, their responsibilities unclear. Eventually, after a stab at an IP solution by the Internet Advisory Board (IAB) was met with resistance, the problem was assigned to the Internet Engineering Task Force (IETF) around 1992.

The IETF has no official members; anyone who wants to join can. It's a laudable policy, but it means that decisions can't be voted on since there is no finite list of members. Instead, the IETF is charged with reaching a "rough consensus." If you think this is an oxymoron, you're right. Especially when you're dealing with a large group of opinionated hackers. For determining IP's successor (the most important technical change in the history of the Internet), "rough consensus" was the recipe for bitter infighting that lasted almost three years.

Internet Protocol still reeks of '70s technology.

After much screaming and kicking over proposals that were essentially the same, the decision was narrowed to three possibilities. The first, PIP ("P" Internet Protocol), was a new system that offered increased flexibility. But it was so radical it never gained favor – there were just too many new features people could find fault with. The second proposal was TUBA (TCP/UDP with Big Addresses), which had one big disadvantage: it was associated with the International Standards Organization (ISO). The rigid and bureaucratic ISO has always been the antithesis of the Internet community, and the "not-invented-here" syndrome meant significant opposition to TUBA. The third proposal, SIP (Simple IP), was largely identical to IP but with longer, 128-bit addresses. After a few cosmetic changes, SIP was selected and knighted "IPNG" – IP Next Generation.

By the end of the year, IPNG should become the official Internet standard. The transition will be gradual and, if all goes as planned, undetectable to users. But while the 128-bit addresses of IPNG seem "future proof," the protocol offers few other advantages – it still reeks of '70s technology. Most importantly, IPNG takes only a small step toward adding the support necessary for high-quality, real-time transmission of video and audio over the Net.

Right now, the time needed to transmit a packet over the Internet varies wildly: it depends on how much other traffic is on the Net. For file transmission, this works fine. But for voice or video, it's intolerable. If your transmission rate drops because the Net is clogged, video frames will be dropped; speech sounds will be clipped or unintelligible.

IPNG's solution is essentially to allow users to prioritize transmissions so a delay-sensitive video packet will be given priority over a file-transmission packet. But Noel Chiappa, a longtime researcher of internetworking issues, argues that this priority scheme won't work, for the reason economists refer to as "the tragedy of the commons." People won't share a free resource equitably. Instead, they'll mark everything as urgent, rendering IPNG's solution useless. A better solution would be to use resource reservation, by which hard bandwidth guarantees can be given to users. But the technique is a marked departure from the spirit of the original IP.

The initial battle over IP was between the improvers, who wanted to change IP as little as possible, and the radicals, who were concerned only with the best possible technical solution. Why then did the improvers win?

Bob Hinden, an engineer at Sun Microsystems and a key figure in the SIP effort, believes SIP was successful because it offered the "most change at the least risk." It's a telling statement. Because of the need to achieve consensus, the IETF standardization process discourages radical change. Instead, the simplest proposals – those with the fewest points to disagree over – have the best chance of winning. While not necessarily a bad policy (simplicity often means efficiency), it's in stark contrast to how decisions were made in the past. Tim Dixon, a network consultant based in London, explains, "in the early Arpanet days, development was done under contract by a few good people who could do what they felt was right." That kind of unfettered autonomy has gone.

Although more constrained than in the past, the old-boy network cabal still holds power. According to Dixon, the battle over IPNG was "a very incestuous process, despite attempts to make it 'open.'" Over the last five years, the network community has grown rapidly and diversified significantly, yet the people involved in IPNG – especially those who backed SIP – were largely old-timers, researchers on the edges of academia. While it's encouraging that corporations haven't taken over the standardization process, the mixed bag of Internet users should be reflected in the makeup of the standards committees. Otherwise, we will end up with protocols good only for certain applications.

Right now, the IETF is like an elementary-school playground where the game rules are determined by the players. The system works fine until competition becomes fierce or kids from other neighborhoods start taking part. Similarly, the IETF combination of rough consensus and open membership doesn't work in such a huge, diverse online community. Task Force politics are stifling innovation and flexibility – the attributes that made the Internet great.

Rather than fighting the entire membership for this "rough consensus," a small committee with full decision-making power in certain technical areas should be appointed. The committee should be elected from anyone who is interested, but controlled to contain representatives from the user community, service providers, and academia. By electing such a committee, the process would remain open and equitable. And by requiring consensus only within the small committee, radical technical changes would still be possible.

These changes would allow the Internet to maintain its technical lead over the creations of mammoth corporations and bureaucratic monsters like the ISO, and still maintain the openness and cultural anarchy that make the Internet unique. If the changes aren't made, IP's successor may be spawned by just such a monster and make the Net a far less friendly place.

Steve G. Steinberg (steve@wired.com) *is a section editor at* Wired.

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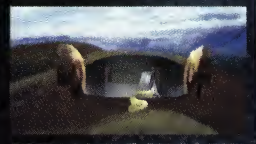

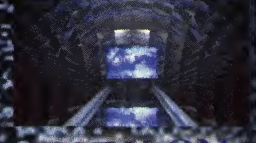

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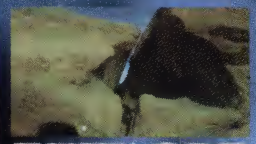

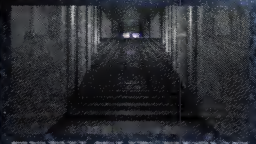

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GOSSIP
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Kevin Kelly talks to the prototypical Renaissance 2.0 artist about why music has ceased to be the center of our cultural life, why art doesn't make any difference anymore, and why Brian Eno offers no resistance to seduction.

eno

S PHILOSOPHY

If anyone could be said to embody the spirit of the artist in the digital age, it's Brian Eno. The 47-year-old holds a degree in fine arts, is the father of a genre of pop music (ambient), produces albums for rock stars, and regularly exhibits multimedia artwork in tony museums. Underlying Eno's worldwide cultural prominence is a spectacularly unusual intelligence. The Brits call him Professor Eno: he was recently named Honorary Doctor of Technology at the University of Plymouth and appointed Visiting Professor at the Royal College of Art in London.

Although he shuns the term, Eno is a Renaissance man, an artist gracefully hacking the new media of LPs, TVs, PCs, CDs, MIDI, photos, and e-mail. He is as comfortable (and brilliant) collaborating on albums with David Bowie, U2, or Laurie Anderson as he is giving a lecture on perfume (he's an expert), haircuts, or "The Studio as a Compositional Tool."

Eno exploits new technology without letting it ensnare him. He knows exactly where to hold a tool so that he can forget he has hold of it. This confluence (indifference to and intimacy with technology) enables Eno to pioneer so many cross-technology arts. As an observer of modern life, his gift is debunking the conventional. He applies his irreverence equally to himself and others, describing his own

PHOTO: STEVE DOUBLE

1992 solo album, Nerve Net, *as "paella: a self-contradictory mess; off-balance, postcool, postroot, uncentered where-am-I? music."*

Wired *executive editor Kevin Kelly interviewed Eno over a period of months via face-to-face conversations in California, the phone, and e-mail. Like many of Eno's projects, it was remixed, reassembled, and tweaked to make it a self-contradictory mess, off-balance, postcool, and very much where-we-are.*

Wired: Somewhere along the line, art seemed to lose its significance. No offense to you, but who cares about painting?

Eno: I'm acutely aware of being involved in something that ought to be making more of a difference than it is. But art has not ceased to affect us; it's just that the process we call art is happening elsewhere, in areas that might be called by other names. I always think of medieval heraldry: so intensely relevant for hundreds of years, and now a total mystery to nearly all of us. The traditional sites for art activity seem to be losing their power, while new sites for art are becoming powerful. We have been looking for art in the wrong places.

Let's say I was to give you a round-trip ticket to the past, when art really made a difference. Where would you go?

The intellectual Arab world at its height – somewhere between, say, the beginning of the 11th century and the middle of the 13th – would have been absolutely amazing to experience.

Why there and then? Why not the Renaissance a little later?

I've never been that thrilled by the Renaissance, to tell you the truth. I can imagine the excitement of having been there, but it seems to me that the Renaissance had a great deal to do with leaving things out of the picture. It was about ignoring part of our psyche – the part that's a bit messy and barbarian. There was also a sense of perfectibility, of the possibility of certainty – a sense that has become a real albatross to us.

But there are analogies between the height of the Arab world and today. At that time, there was a big shift from one type of consciousness to another. Old systems decayed and broke up, and, painfully, new ones were born. The equilibration between science and alchemy, and philosophy and religion, would have been thrilling to behold.

Now, am I allowed to move forward as well, into the future?

It's a different ticket, but I can grant that as well. How far in the future do you want to go?

Oh, only about 50 years.

Doesn't that seem like a waste of magic? Fifty years – you might get there yourself. You just can't wait, is that the problem?

Yeah, I can't wait. I want to know what happens to Africa.

Africa?

Africa is everything that something like classical music isn't. Classical – perhaps I should say "orchestral" – music is so digital, so cut up, rhythmically, pitchwise and in terms of the roles of the musicians. It's all in little boxes. The reason you get child prodigies in chess, arithmetic, and classical composition is that they are all worlds of discontinuous, parceled-up possibilities. And the fact that orchestras play the same thing over and over bothers me. Classical music is music without Africa. It represents old-fashioned hierarchical structures, ranking, all the levels of control. Orchestral music represents everything I don't want from the Renaissance: extremely slow feedback loops.

If you're a composer writing that kind of music, you don't get to hear what your work sounds like for several years. Thus, the orchestral composer is open to all the problems and conceits of the architect, liable to be trapped in a form that is inherently nonimprovisational, nonempirical. I shouldn't be so absurdly doctrinaire, but I have to say that I wouldn't give a rat's ass if I never heard another piece of such music. It provides almost nothing useful for me.

But what *is* tremendously exciting to me is the collision of vernacular Western music with African music. So much that I love about music comes from that collision. African music underlies practically everything I do – even ambient, since it arose directly out of wanting to see what happened if you "unlocked" the sounds

in a piece of music, gave them their freedom, and didn't tie them all to the same clock. That kind of free float – these peculiar mixtures of independence and interdependence, and the oscillation between them – is a characteristic of West African drumming patterns. I want to go into the future to see this sensibility I find in African culture, to see it freed from the catastrophic situation that Africa's in at the moment. I don't know how they're going to get freed from that, but I desperately want to see this next stage when African culture begins once again to strongly impact ours.

Do you have any guesses about what that reunited culture would look like?

Yes. Do you know what I hate about computers? The problem with computers is that there is not enough Africa in them. This is why I can't use them for very long. Do you know what a nerd is? A nerd is a human being without enough Africa in him or her. I know this sounds sort of inversely racist to say, but I think the African connection is *so* important. You know why music was the center of our lives for such a long time? Because it was a way of allowing Africa in. In 50 years, it might not be Africa; it might be Brazil. But I want *so desperately* for that sensibility to flood into these other areas, like computers.

Whenever I hear a neat dichotomy between the fuzzy logic of Africa versus the digital logic of a white tribe, I always find it interesting to triangulate and introduce the Asians. Where do the Asians fit into this?

PHOTO: DAVID GAMBLE/SYGMA

African music underlies practically everything I do – even ambient, since that arose directly out of wanting to see what happened if you "unlocked" the sounds in a piece of music, gave them their freedom, and didn't tie them all to the same clock.

It could be that any strong infusion from another place would help greatly. The African one is just the one I understand well. But the Near East can show what happens. For instance, harmony is primarily a Western invention. There is no equivalent to harmonic interest in Arabic music. In the West, the orchestra was invented to play harmonies. But in the Near East, the whole orchestra plays the same thing. So Arabs take the orchestra, which was basically a machine for making harmony, and make it a machine for making texture, which is an Asian preoccupation. It plays one voice, always. But it's a voice that can have different and changing textures. So this is a perfect example of using a Western tool and linking it with what I think is an Asian sensibility, the interest in texture. And, bingo! There you have it, this huge texture-making machine, the orchestra.

So, how does one Africanize, or Brazilianize, or otherwise liberate a computer?

Get mad with it. I ask myself, What is pissing me off about this thing? What's pissing me off is that it uses so little of my body. You're just sitting there, and it's quite boring. You've got this stupid little mouse that requires one hand, and your eyes. That's it. What about the rest of you? No African would stand for a computer like that. It's imprisoning.

So, we need to make whole-body computers that get the heart pumping, through which we can dance out text and pictures and messages? Why haven't we done that yet?

History is changed by people who get pissed off. Only neo-vegetables enjoy using computers the way they are at the moment. If you want to make computers that really work, create a design team composed only of healthy, active women with lots else to do in their lives and give them carte blanche. Do not under any circumstances consult anyone who (a) is fascinated by computer games (b) tends to describe silly things as "totally cool" (c) has nothing better to do except fiddle with these damn things night after night.

What? And give up all those totally cool buttons?!

I've been telling synthesizer manufacturers for *years* that the issue is not increasing the number of internal options. The issue is increasing rapport, making a thing that relates to you physically in a better way. Of course the easy course is to add options, since absolutely no conceptual rethink is required. But the relationship between user and machine might be better achieved by reducing options.

If I could give you a black box that could do anything, what would you have it do?

I would love to have a box onto which I could offload choice making. A thing that makes choices about its outputs, and says to itself, This is a good output, reinforce that, or replay it, or feed it back in. I would love to have this machine stand for me. I could program this box to be my particular taste and interest in things.

Why do you want to do that? You have you.

Yes, I have me. But I want to be able to sell systems for making my music as well as selling pieces of music. In the future, you won't buy artists' works; you'll buy software that makes original pieces of "their" works, or that recreates their way of looking at things. You could buy a Shostakovich box, or you could buy a Brahms box. You might want some Shostakovich slow-movement-like music to be generated. So then you use that box. Or you could buy a Brian Eno box. So then I would need to put in this box a device that represents my taste for choosing pieces.

I guess the only thing weirder than hearing your own music being broadcast on the radios of strangers is hearing music that you *might have* written being broadcast!

Yes, music that I might have written but didn't!

Will you still like the idea of these surrogate Brian Enos when they start generating your best work?

Sure! Naturally, it's a modifiable box, you know. Say you like Brahms *and* Brian Eno. You could get the two of them to collaborate on something, see what happens if you allow them to hybridize. The possibilities for this are fabulous.

What's left for us to do then?

Cheat. And lie.

Some people listening to your music might think that it is already being written by one of your black boxes.

For years, I have been using rules to write music, but without computers. For instance, I've used systems of multiple tape loops that are allowed to reconfigure in various ways, while all I do is supply the original musical sounds or elements and then the system keeps throwing out new patterns of them. It is a kaleidoscopic music machine that keeps making new variations and new clumps.

My rules were designed to try to make a kind of music I couldn't predict. That's to say, I wanted to construct "machines" (in a purely conceptual sense – not physical things) that would make music for me. The whole idea was summarized in the famous saying (which I must have shouted from the ramparts a thousand times): "Process not product!" The task of artists was to "imitate nature in its manner of operation" as John Cage put it – to think of ways of dealing with sound that were guided by an instinct for beautiful "processes" rather than by a taste for nice music.

By the early '70s, I had made and experienced a great deal of systems music, as all this had come to be known. I wanted to make music that was not only *systemically* interesting, but also that I felt like hearing again. So, increasingly, my attention went into the sonic material that I was feeding into my "repatterning machines." This became my area: I extended the composing act into the act of constructing sound itself.

This wasn't an idea by any means original to me – I picked it up from people like Phil Spector and Shadow Morton and Jimi Hendrix. They were all people from the world of pop, a world that had hardly penetrated the relatively insular landscape of "systems music," which still regarded the palette available to a composer as a series of little disconnected islands of discrete and describable sounds – "viola," "clarinet," "tam-tam" – rather than as a place where you faced the compositional problem that every rock musician was used to dealing with: what sound should I invent?

Can you imagine what music will be like 20 years from now?

What people are going to be selling more of in the future is not pieces of music, but systems by which people can customize listening experiences for themselves. Change some of the parameters and see what you get. So, in that sense, musicians would be offering unfinished pieces of music – pieces of raw material, but highly evolved raw material, that has a strong flavor to it already. I can also feel something evolving on the cusp between "music," "game," and "demonstration" – I imagine a musical experience equivalent to watching John Conway's computer game of *Life* or playing *SimEarth,* for example, in which you are at once thrilled by the patterns and the knowledge of how they are made and the metaphorical resonances of such a system. Such an experience falls in a nice new place – between art and science and playing. This is where I expect artists to be working more and more in the future.

Could we call this new style "interactive music?"

In a blinding flash of inspiration, the other day I realized that "interactive" anything is the wrong word. Interactive makes you imagine people sitting with their hands on controls, some kind of gamelike thing. The right word is "unfinished." Think of cultural products, or art works, or the people who use them even, as being unfinished. Permanently unfinished. We come from a cultural heritage that says things have a "nature," and that this nature is fixed and describable. We find more and more that this idea is insupportable – the "nature" of something is not by any means singular, and depends on where and when you find it, and what you want it for. The functional identity of things is a product of our interaction with them. And our own identities are products of our interaction with everything else. Now a lot of cultures far more "primitive" than ours take this entirely for granted – surely it is the whole basis of animism that the universe is a living, changing, changeable place. Does this make clearer why I welcome that African thing? It's not nostalgia or admiration of the exotic – it's saying, Here is a bundle of ideas that we would do well to learn from.

Finishing implies interactive: your job is to complete something for that moment in time. A very clear example of this is hypertext. It's not pleasant to use – because it happens on computer screens – but it is a far-reaching revolution in thinking. The transition from the idea of text as a line to the idea of text as a web is just about as big a change of consciousness as we are capable of. I can imagine the hypertext consciousness spreading to things we take in, not only things we read. I am very keen on this unfinished idea because it co-opts things like screen savers and games and models and even archives, which are basically unfinished pieces of work.

So a screen saver would be the visual equivalent of an Eno music machine?

I've been working on my own mutations of an After Dark screen saver called Stained Glass. If you set up the initial conditions slightly differently, you see a completely different sequence of events. All your interaction with the program is right at the beginning, when you set it up. But I think this should certainly be called interactive, as the whole process of what then happens depends on what you've set up at the beginning.

Besides being in an unfinished state, do you have any other notions of what music will be like in 20 years? 204 ▸

super search
Cybrarian
Reva Basch
is the
ultimate
intelligent
agent.
By John Whalen

Wired: The major commercial databases tend to carry mainstream periodicals, not alternative publications. Is this bad news for the preservation of memetic diversity?

Basch: It's funny – a lot of this stuff has been driven by economics. Until now, if the information didn't already exist in computer-readable form, or if the money wasn't there, it wasn't made into a database. But now, those smaller, alternative pubs are popping up on the Internet, big time. It's a lot cheaper to put your publication on the Net and maintain it than it is to go through one of the major database producers like Dialog or Nexis. So I'm no longer waiting for alternative publications to come up on the standard commercial online services. They're doing an end run – they're putting themselves right on the Net. Which is in some ways as it should be. The trouble is, searching on the Internet still leaves much to be desired.

What do you need to make the Internet more navigable?

There are some pretty powerful text-analysis engines out there that are being worked on. But my real dream would be a Net-wide, completely up-to-date, hierarchically arranged subject indexing capability that is as sophisticated as what you find in the commercial databases. I'm not holding my breath for that.

One thing that interests me is the way home pages on the World Wide Web are being used to link information. In my business, we've been asking for hypertext links to related documents for years, and it hasn't happened, except on a very limited level. And, of course, that's what the World Wide Web is all about.

Let's talk about intelligent agents. They've been described as digital butlers that roam the Infobahn gathering data for you – based on your needs – and learn more about your interests over time.

Apple has this really nauseating movie about an intelligent agent, a little dorky-looking guy with a bow tie. The user clicks on "him" and "he" goes out to get data from all over, using this very conversational dialog. It's by no means a new idea.

Last year, Paul Saffo made the really good point [*Wired* 2.03, page 74] that the next salable commodity in cyberspace is going to be point of view, in which you subscribe to an intelligent agent whose interests and points of view map yours. You say, "OK, Rush Limbaugh knowbot," or "OK, Ralph Nader knowbot, go out there and get me stuff from the Net that you think is important." Personifying the agent – I think we're going to see a lot of that. It's an interesting idea: Whose filter do you want to view the Net through?

It might also become a way for people to treat data more hermetically – to shun information that clashes with their particular ideologies.

Oh, yeah. The Dittohead view of the world.

It's sort of the opposite end of the classical media model. For years we've had the mainstream media force-feeding us all the news *they* deem fit to print, and now we face the prospect of having information become so fragmented and specialized that political consensus becomes even harder to achieve.

It depends on how it's implemented. I can't see there being any more polarization or skewed set of views than we're getting from media today. I've just got to believe that it's in the nature of the Net and self-publishing to encourage a proliferation of ideas – may 10,000 intelligent agents bloom. There's going to be a lot more points of view than in today's media.

So, what will you be doing 10 years from now when we all have digital butlers and cybervalets?

A hell of a lot less direct online searching. But there are always going to be people who, even though they know they can search for themselves, aren't going to be interested in trying. All they want is the data; they'll be willing to pay somebody else for that.

Is it addicting to have all this information under your power?

It's addicting yet self-limiting, because as long as the systems charge what they do, it's like the '80s and coke: you can work yourself into the poorhouse.

You raise a good point. Online searching is very expensive. And with public libraries cutting back on reference services, aren't we in danger of making information a commodity that only the élite can afford?

That's a question I would have answered very differently a year ago. The hype about the Internet is driving the commercial online services to change prices and offer more user-friendly interfaces. One of the second-tier online services, Data Times, just announced a $39.95-a-month flat-fee package for newspapers and trade journals – with considerable overlap of Dialog's databases. There are no connect charges, and it costs maybe a couple of bucks for each article retrieved. With this, you're getting down to the level of the average person.

How will living and interacting online warp our cognition and perhaps change the way we interact offline? You've written about how mainlining text at 9600 bits per second for a living has complicated your non-virtual life.

I notice it in particular when I read for pleasure. I just can't keep my eyes still. I have to remind myself to slow down and say, "Hey, you're reading for style, not content, stop browsing, start reading." It does have an accelerating effect on life. At parties, I'll scan the people: "not interesting, not interesting." Which is *awful* – sort of looking over their shoulders for the next person who might *add value*. It's a terrible, terrible thing to do.

I'll tell you something else I've discovered – I am less and less satisfied with superficial social connections. Online, especially on The Well, you really get into it, perhaps because of the conferencing software; there is one deep, deep conversation devoted to a particular issue. I find that affects my relationships with offline friends, especially people I haven't seen for a while. There's a lack of depth and context and continuity in a lot of my face-to-face relationships. I think the whole quality of human interaction is changing.

So what is it about this emerging modem society that makes it more intimate?

Well, part of it, of course, is the anonymity. And part of it is asynchronicity – you can compose a well-crafted, thoughtful posting offline. Also, you can deliberate – you don't have to respond in real time. ■ ■ ■

You won't find Reva Basch listed in the Yellow Pages under "Cybrarians," though that's how she describes her job. Pacific Bell lists her under the more prosaic "Information Retrieval Service and Research."

Whatever you call her, Basch wrote the book on the subject: *Secrets of the Super Searchers*. She – along with 3,000 to 5,000 independent searchers nationwide – is an information-age librarian who sleuths online databases for her clients at US$80 an hour. John Whalen caught up with her in the green hills of Berkeley, California – where, from her home office, Basch "data-surfs" on behalf of a varied list of clients, ranging from Silicon Valley start-ups to new moms desperately seeking lactation consultants.

John Whalen (jw@scruznet.com) *writes about the media and digital culture. He is also the co-author of the book* The 50 Greatest Conspiracies of All Time, *published by Citadel Press.*

BILL ZEMANEK

. . . . Thomas Paine was one of the first journalists to use media as a weapon against

The Age of

He should be resurrected as

If any father has been forsaken by his children, it is Thomas Paine. Statues of the man should greet incoming journalism students; his words should be chiseled above newsroom doors and taped to laptops, guiding the communications media through their many travails, controversies, and challenges. Yet Paine, a fuzzy historical figure of the 1700s, is remembered mostly for one or two sparkling patriotic quotes – "These are the times that try men's souls" – and little else.

Thomas Paine, professional revolutionary, was one of the first to use media as a powerful weapon against an entrenched array of monarchies, feudal lords, dictators, and repressive social structures. He invented contemporary political journalism, creating almost by himself a mass reading-public aware for the first time of its right to encounter controversial opinions and to participate in politics.

Between his birth in 1737 and his death in 1809, enormous political upheavals turned the Western world upside down – and Paine was in the middle of the biggest ones. His writings put his life at risk in every country he lived in – in America for rebellion, in England for sedition, in France for his insistence on a merciful and democratic revolution. At the end of his life, he was shunned by the country he helped create, reviled as an infidel, forced to beg friends for money, denied the right to vote, refused burial in a Quaker cemetery. His grave was desecrated, his remains were stolen.

A popular old nursery rhyme about Paine could just as easily be sung today:

Poor Tom Paine! there he lies:
Nobody laughs and nobody cries.
Where he has gone or how he fares
Nobody knows and nobody cares.

Certainly that's true of the media. The modern-day press has forgotten this brilliant, lonely, socially awkward progenitor, who pioneered the concept of the uncensored flow of ideas, and developed a new kind of communications in the service of the then-radical proposition that people should control their own lives.

In this country, his memory has been tended by a few determined academics and historians and a stubborn little historical society in New Rochelle, New York, where he spent a good deal of his final, impoverished days.

So what?

We've all been numbed by drowsy history-book pedagogy about founders, patriots, and dusty historical heroes. If journalism and the rest of the country have forgotten Paine, why should *we* remember another of history's lost souls?

Because we owe Paine. He is our dead and silenced ancestor. He made us possible. We need to resurrect and hear him again, not for *his* sake but for ours. We need to know who he was, to understand his life and work, in order to comprehend our own revolutionary culture. Paine's odyssey made him the greatest media figure of his time, one of the unseen but profound influencers of ours. He made more noise in the information world than any messenger or pilgrim before or since. His mark is now nearly invisible in the old culture, but his spirit is woven through and through this new one, his fingerprints on every Web site, his voice in every online thread.

If the old media (newspapers, magazines, radio, and television) have abandoned their father, the new media (computers, cable, and the Internet) can and should adopt him. If the press has lost contact with its spiritual and ideological roots, the new media culture can claim them as its own.

For Paine does have a legacy, a place where his values prosper and are validated millions of times a day: the Internet. There, his ideas about communications, media ethics, the universal connections between people, and the free flow of honest opinion are all relevant again, visible every time one modem shakes hands with another.

Tom Paine's ideas, the example he set of free expression, the sacrifices he made to preserve the integrity of his work, are being resuscitated by means that hadn't existed or been imagined in his day – via the blinking cursors, clacking keyboards, hissing modems, bits and bytes of another revolution, the digital one. If Paine's vision was aborted by the new technologies of the last century, newer technology has brought his vision full circle. If his values no longer have much relevance for conventional journalism, they fit the Net like a glove.

The Net offers what Paine and his revolutionary colleagues hoped for – a vast, diverse, passionate, global means of transmitting ideas and opening minds. That was part of the political transformation he envisioned when he wrote, "We have it in our power to begin the world over again." Through media, he believed, "we see with other eyes; we hear with other ears; and think with other thoughts, than those we formerly used."

His writing is infused with the sense – especially relevant now as the digital culture spreads across the world – that a new age was about to burst open all around him. This would be an unmistakable, great awakening, even if it came in stages. Instead of seeing a single bud on a winter tree, he wrote, "I should instantly conclude that the same appearance was beginning, or about to begin, everywhere; and though the vegetable sleep will continue longer on some trees and plants than on others, and though some of them may not blossom

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Jon Katz, Wired*'s media critic, can be e-mailed at* jdkatz@aol.com.

the entrenched power structure.

Paine

the moral father of the Internet.

Jon Katz explains why. . . . . .

Illustration by Mark Summers

for two or three years, all will be in leaf in the summer, except those which are rotten."

It is not difficult to perceive, he wrote, "that the spring is begun."

Paine's life and the birth of the American press prove that information media, taken together, were never meant, collectively, to be just another industry. Information wants to be free. That was the familiar and inspiring moral imperative behind the medium imagined by Paine and Thomas Jefferson. Media existed to spread ideas, to allow fearless argument, to challenge and question authority, to set a common social agenda.

Asked about the reasons for new media, Paine would have answered in a flash: to advance human rights, spread democracy, ease suffering, pester government. Modern journalists would have a much rougher time with the question. There is no longer widespread consensus, among practitioners or consumers, about journalism's practices and its goals.

Of course, the ferociously spirited press of the late 1700s that Paine helped invent differed from the institution we know today. It was dominated by individuals expressing their opinions. The idea that ordinary citizens with no special resources, expertise, or political power – like Paine himself – could sound off, reach wide audiences, even spark revolutions, was brand-new to the world. In Paine's wake, writes Gordon Wood in *The Radicalism of the American Revolution*, "every conceivable form of printed matter – books, pamphlets, handbills, posters, broadsides, and especially newspapers – multiplied and were now written and read by many more ordinary people than ever before in history."

Never skilled in business, Paine failed to foresee how fragile and easily overwhelmed these values and forms of expression would be when they collided with free-market economics. The rotary press and other printing technologies that later made it possible to mass-market newspapers also led publishers to make newspapers tamer and more moderate so their many new customers wouldn't be offended. Big, expensive printing presses churning out thousands of copies meant opinionated private citizens like Paine could no longer afford to own or have direct access to media, and journalism couldn't afford to give voice to opinionated private citizens.

Paine once warned a Philadelphia newspaper editor about the distinction between editorial power and the freedom of the press. It was a caution neither the editor nor his increasingly wealthy and powerful successors took to heart: "If the freedom of the press is to be determined by the judgment of the printer of a Newspaper in preference to that of the people, who when they read will judge for themselves, then freedom is on a very sandy foundation."

So it is. Paine's worst fear was echoed more than 150 years later by critic A.J. Liebling, who wryly observed: "In America, freedom of the press is largely reserved for those who own one." Almost everyone else has been shut out. But media history is being reversed. With computers and modems, individuals are pouring back in. The people who own the presses still have enormous power, but every day, very much against their will, they're facing a dread reality: they're going to have to learn to share.

The people running the traditional media are in a state of near panic at this competition, at the fragmentation of an audience they once monopolized. In their search for answers, they seem to be looking at everything save what's most important: values. Although journalism presumes great and lofty purpose, it has grown preoccupied with ratings, market penetration, stockholders, cultural demographics, and bottom lines. Almost overwhelmingly owned and run by corporations and business sharks with turnips for hearts and market research for ideology, the press is disconnected and resented. One opinion survey after another confirms pervasive public mistrust.

Like the specters introduced by the Ghost of Christmas Future, today's media are what the Net should never become – but will surely evolve into if it fails to develop, articulate, fight fiercely for, and maintain a value system other than expanded memory, whiz-bang toys, and money. The digital age is young, ascending, diverse, already nearly as arrogant, and, in parts, as greedy as the mass media it is supplanting. The new generation faces enormous danger from government, from corporations that control the traditional media, from commercialization, and from its own chaotic growth.

Thomas Paine is a guide, the conscience that can prompt new media to remember the past chiefly in order not to repeat it.

He often introduced his most controversial ideas formally and courteously, writing, for example, The following notion is put under your protection. You will do us the justice to remember that he who denies the right of every man or woman to his own opinion makes a slave of them, because he precludes their right of changing their own minds.

This notion is put under your protection, too: The Internet is Thomas Paine's bastard child. Thomas Paine should be our hero.

Citizens, wrote Paine, are meant to act, think, and communicate

29 Jan 1737 Thomas Paine born, Thetford, England

10 Jan 1776 *Common Sense* published

4 July 1776 American Independence declared

Nov 1782 War of Independence ends

22 Feb 1791 *Rights of Man* published

16 Feb 1792 *Rights of Man, Part Two* published

13 Sept 1792 Paine moves to Paris

18 Dec 1792 Paine tried in absentia in England for seditious libel

The sad part of Paine's story is that it's necessary to pause here and tell it to those who may never have heard it.

He lived a life that would make the cheesiest Hollywood screenwriter blush in frustration. He was born in England. He ran away from home to sail as a pirate, then worked as a staymaker and matched wits with smugglers as a customs collector. He lobbied Parliament for better pay for himself and fellow customs collectors. He lost his job but met Benjamin Franklin, who urged him to move to America, and who became a lifelong pen pal.

One of the regulars at Independence Hall, Paine was a philosophical soul mate of Thomas Jefferson. He fought and froze with his buddy George Washington at Valley Forge. King George III badly wanted to hang Paine because he helped touch off the American Revolution with his writings, but got the chance to try him for sedition after Paine had the gall to return to England and lobby for an end to the monarchy.

Paine fled to France, where the bloodthirstier leaders of the French

Revolution ordered him killed because he urged leniency for the members of the overthrown regime and because they feared he would alert Americans to the increasingly undemocratic Gallic uprising. Clergymen all over the world cursed him for his heretical religious views. Businessmen despised him even more for his radical views about labor.

In between was high drama, great daring, narrow scrapes – wandering revolutionary war battlefields dodging British bullets, fleeing England 20 minutes ahead of warrants ordering his arrest, coming within hours of being guillotined in Paris. Paine seemed to live most happily in boiling water.

The Big Concept man of his time, his deep ideas still resonate: An end to monarchies and dictatorships. American independence from England, of course. International federations to promote development and maintain peace. Rights and protections for laborers. An end to slavery. Equal rights for women. Redistribution of land. Organized religion was a cruel and corrupt hoax. Public education, public employment, assistance for the poor, pensions for the elderly. And above all, a fearless press that tells the truth, gives voice to individual citizens, tolerates opposing points of view, transcends provincialism, is accessible to the poor as well as the rich.

He was as astonishingly productive as he must have been obnoxious, mouthing off about everything from yellow fever to iron bridge construction. Although he wrote countless articles and pamphlets during his life, his core works are four powerful, sometimes beautifully written, flaming-with-indignation essays.

Common Sense, an argument for independence, helped spark the American Revolution. *Rights of Man,* an essay written in support of the French Revolution, attacks hereditary monarchies and called for universal democracy and human rights. *The Age of Reason* challenges the logic behind organized religion's grip on much of the Western world, and *Agrarian Justice* calls for radical reforms in the world economy, especially in land ownership. The first three constitute the three bestselling works of the 18th century.

It is almost impossible, today, to imagine the overwhelming impact of *Common Sense.*

Paine arrived in Philadelphia in 1774 at the age of 37 with little more than a letter of reference from Franklin. He rented a room and landed a job as executive editor of a new publication called *Pennsylvania Magazine.* In January of 1776, *Common Sense* went on sale for two shillings.

Historian Gregory Claeys, in *Thomas Paine, Social and Political Thought,* quotes one colonial observer who described *Common Sense* as bursting forth "like a mighty conqueror bearing down all opposition." It became America's first bestseller, with more than 120,000 copies sold in its first three months, and possibly as many as half a million in its first year – this in a country whose population was 3 million. Newspapers, then crammed with controversial viewpoints, scrambled to reprint it. Common people quoted it to one another.

It had, wrote a contemporary historian, "produced most astonishing effects; and been received with vast applause, read by almost every American; and recommended as a work replete with truth." It was nicely written, too, one of the first and most dramatic of the anthems and call-to-arms that run through Paine's writing.

The cause of America, wrote Paine, was the cause of all mankind. "O! ye that love mankind! Ye that dare oppose not only the tyranny but the tyrant, stand forth! Every spot of the old world is overrun with oppression. Freedom hath been hunted round the globe. Asia and Africa have long expelled her. Europe regards her like a stranger, and England hath given her warning to depart. O! receive the fugitive, and prepare in time an asylum for mankind."

How Paine, poorly educated and inexperienced as a writer, came to produce such a work remains a historical puzzle. American historians have traditionally advanced the idea that Paine, who already hated the British ruling classes and had been disillusioned in his battle to improve working conditions for his fellow customs collectors in England, needed only to step onshore and catch the revolutionary fever raging all around for his literary gifts to ignite.

But Paine's democratic republicanism had deep British roots. He might have been influenced by some of the world's earliest, least-known and best political journalists, such as the late 17th-century pamphleteers Sir William Molesworth and Walter Moyle. But such high-brow English republicans had no notions of democracy or universal suffrage – not to mention representative government, which they considered anarchic and dangerous. Those were Paine's additions. He broadened his definitions of "the people" to include laborers, slaves, women, fishermen, and artisans. Paine's journalistic writings about these new notions of democracy in *Common Sense,* wrote Jefferson, "rendered useless almost everything written before on the structures of government."

Were Paine to enjoy in 1995 the kind of literary success he had in his day, he would earn millions in royalties, rights, and speaking fees. But Paine didn't earn a shilling from the book. He paid the cost of publication for one edition – 30 pounds – himself, then donated the copyright and all royalties to the colonists' struggle for independence. Royalties would make his work more expensive, he feared, and thus less accessible. It's tough to imagine Paine's words coming out of some Washington journalist's mouth today: "As my wish was to serve an oppressed people, and assist in a just and good cause, I conceived that the honor of it would be promoted by my declining to make even the usual profits of an author, by the publication (of *Common Sense*) ... and there I gave up the profits of the first edition" – to be disposed of, he stipulated, "in any public service or private charity." This idea cost him, in the most literal sense: Paine was impoverished for much of his life.

Paintings of Washington ferrying his troops across the Delaware

freely, to live peacefully – as long as they avoid trampling on the rights of others.

21 Jan 1793 Louis XVI executed

25 Dec 1793 Paine arrested in Paris

1794 *The Age of Reason* published

4 Nov 1794 Paine released

1797 *Agrarian Justice* published

Nov 1802 Paine returns to America

8 June 1809 Thomas Paine dies

have bored schoolchildren for 200 years. Kids might have more interest if they could see Paine's ghost hovering in the background. In 1776, the Colonial Army was virtually defeated, its dispirited troops freezing and starving outside Philadelphia. Even the most die-hard revolutionaries were giving up. Then Paine started cranking out a series of pamphlets called "The American Crisis."

At dusk on Christmas Day, a desperate George Washington ordered what remained of his hungry, ill-equipped army – the snow was spotted red from their bleeding bare feet – to gather into small squads and listen as their officers read them excerpts from Paine's latest rant. In countless letters and diaries, the soldiers were later to recount how many of them wept when they heard what Paine wrote. They found in his now-famous words the strength to continue: "These are the times that try men's souls. The summer soldier and the sunshine patriot will, in this crisis, shrink from the service of their country; but he that stands it *now*, deserves the love and thanks of man and woman. Tyranny, like hell, is not easily conquered; yet we have this consolation with us, that the harder the conflict, the more glorious the triumph."

That night, crossing the river through a storm of hail and sleet, Washington's army surprised and defeated the mercenaries occupying Trenton. The victory is considered one of the major turning points in the war.

If it sounds like a fairy tale from another world, it was. But it pales next to the fairy tale that our world would seem to him. We can conceive and transmit ideas and send them all over the world in seconds. We can leave them and store them for others to see and answer. But for Paine, moving an idea from one place to another at all was a spiritual notion, a miraculous vision. He imagined a global means of communication, one in which the boundaries between the sender and receiver were cleared away.

Such freedom was, to Paine, one of the fundamental rights of mankind. And it was the essence of media. He shared this notion most intensely with his cohort Thomas Jefferson. The two corresponded constantly about how ideas were conceived and distributed.

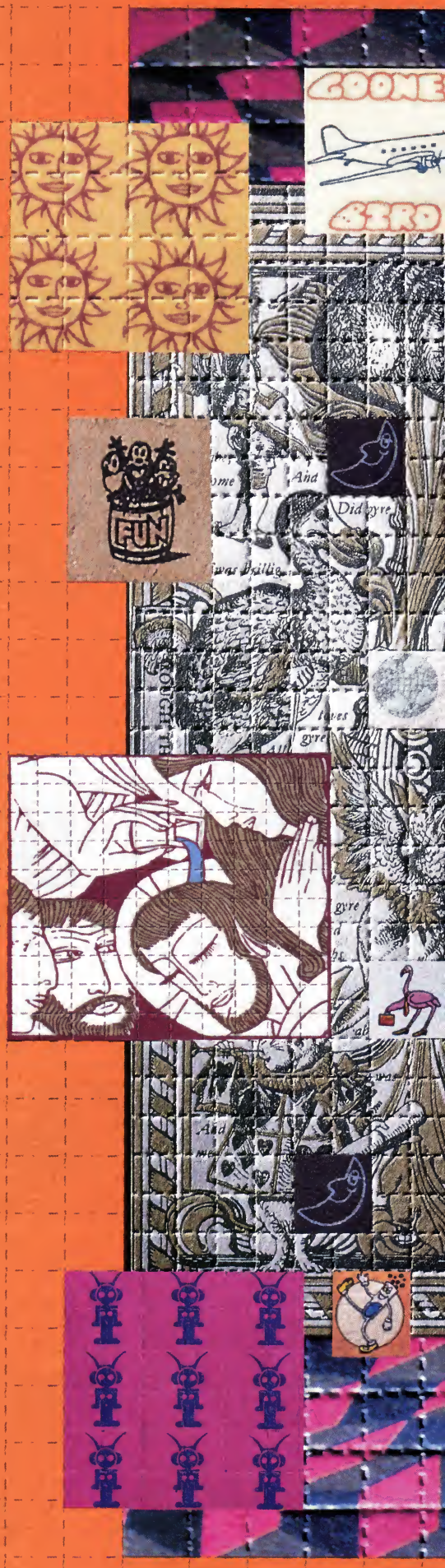
Their foresight and their relevance to the promise of the Net was captured by Jefferson when he wrote: "That ideas should spread freely from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density at any point, 210►

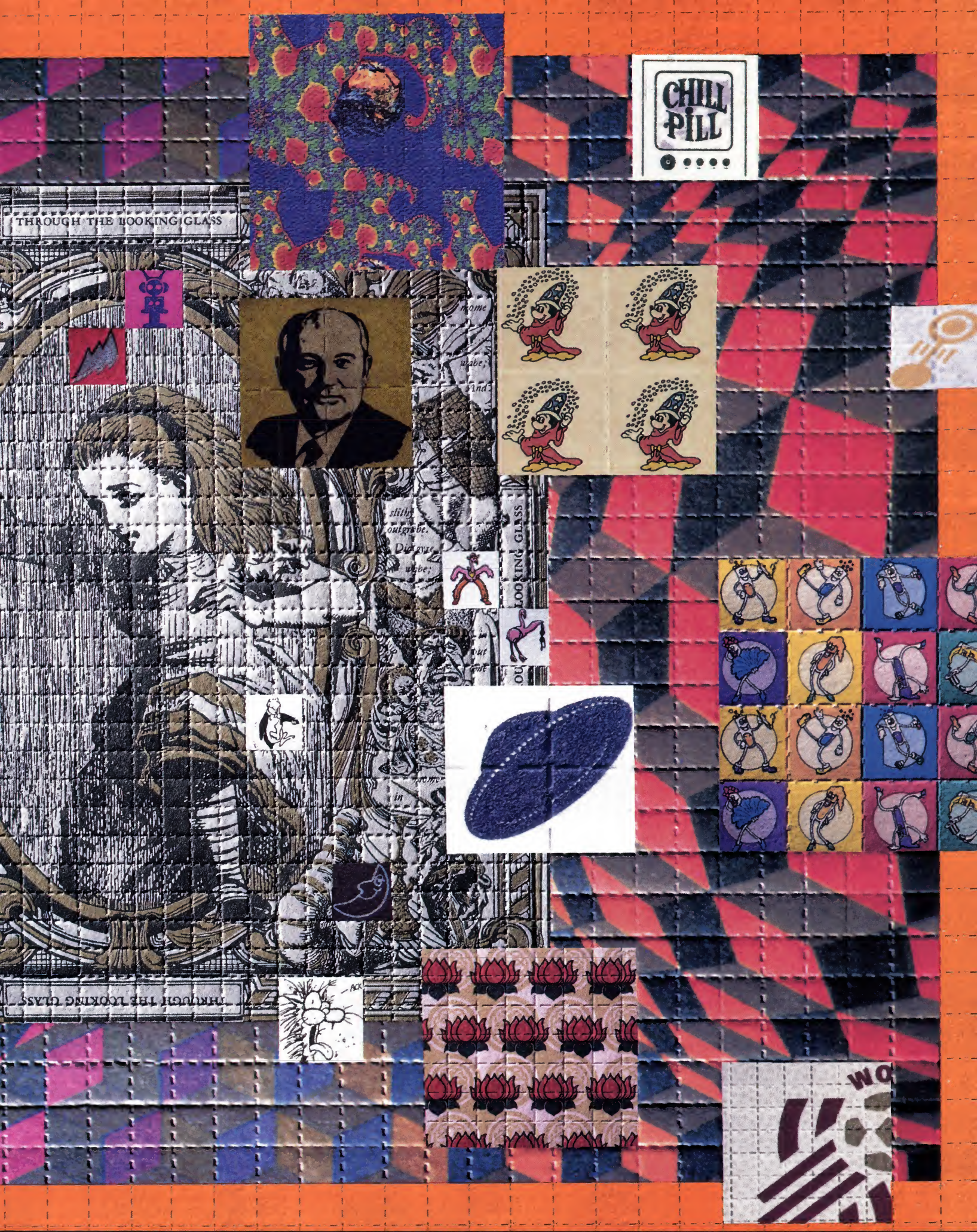
ACID ART

Before you lick that tab, look closely. LSD blotters have long been a canvas to artists and drug dealers, whose pop-culture dabblings burst with detail, symbolism, and color. Acid artists paint each tiny paper square with a picture or use a block for a larger work, which is then broken down into individual hits. The type of acid then acquires the name of the picture on the blotter. (Remember the Deadhead who raved about "that *Alice in Wonderland* acid"?)

Blotters have been neglected in the art world, no doubt because of their disposable nature. But these bits of illicit paper may finally win artistic recognition, thanks to Mark McCloud, head of the Institute of Illegal Images, which has been collecting LSD blotters for 20 years. The more than 175 prints in their archives include blotters made by the DEA and Interpol. McCloud's collection has surfaced at galleries across the United States; it won a red-ribbon award at the San Francisco County Fair.

So, before you embark on an eight-hour trip to innerspace, consider framing that LSD rather than popping it. Aldous Huxley would be stunned to find that the doors of perception have opened this far. To see blotter art online, check out *http://www.hotwired.com/Ren2.0/Retina.* – *Jennifer Holmes*




THROUGH THE LOOKING GLASS
CHILL PILL

Beats Skinning Hogs

PC manufacturer Gateway 2000 grew into a multibillion-dollar business in just seven years.

Charles Platt went to South Dakota to see how.

Photographs by Norman Mauskopf.

I'm sitting with a guy named Jerry in Jim's I-29 Liquor & Lounge out here in North Sioux City, South Dakota. If you follow Interstate 29 north and take the second exit after the state line, you'll find Jim's across from the Olde Glory Fireworks factory, next to a dog-racing track. It's a funky little place with two pool tables, country music on the jukebox, and draft Miller for 75 cents served in old-fashioned jelly jars – the kind that have screw threads molded into the rim.

Jerry is sitting next to me on one of the beat-up black vinyl bar stools, wearing a checked shirt and a baseball cap. He used to work in the local hog-processing plant, where him and his partner used razor-sharp knives to scrape hair off of the carcasses. Jerry tells me they had to work fast, 'cause the plant was processing 800 hogs an hour. He wore steel-mesh gauntlets to keep from getting cut, but there were always accidents, like when one of the hogs broke loose before it got killed and leaped onto Jerry's back. He had to throw it off and beat its head with an iron pipe.

On the killing floor in the summer, it's a hundred degrees and it stinks something terrible. The work's so hard, you wake up in the morning, your hand's all clenched up from holding the knife, and you can't move your arm. Jerry's Vietnamese wife still works at the plant – there's a lot of Vietnamese and Mexican labor there since the union was broke a few years back – but he quit and got himself a job at Gateway 2000, the new computer factory. The pay ain't so good, but the place sure smells a whole lot better, and his arm doesn't hurt anymore. In fact, Jerry says that a lot of folks around here are too proud to admit it, but Gateway has changed their lives. When I go visit the factory I should bear this in mind, he says. Maybe it'll help me keep things in perspective.

Sioux City has a population of about 80,000, but it lies in Iowa, a mile south. *North* Sioux City is a tiny community, dwarfed by the flat, white, winter wasteland of South Dakota. There's a cluster of ramshackle wooden houses under some trees near a water tower, and a two-lane highway runs past a liquor store and a row of funky little bar-restaurants built from boards and cinder blocks. You could drive straight through North Sioux City and hardly even notice it.

But you'd notice Gateway 2000. Right beside the highway, just outside of town, stand a couple of two-story buildings with white, ribbed metal walls, like utilitarian trailer homes. The buildings are gigantic, a quarter-mile long, and next to them is a parking lot the size of an airfield. Even at midnight, there are lights burning and big rigs waiting at the loading dock with their engines idling, exhausts steaming in the frigid air.

Most people know Gateway from its distinctive, lavish, eight-page ads that run in half a dozen computer magazines. (Macintosh owners may have missed the ads, as they're aimed at PC users.) Every ad tells a wacky story. One of them shows Gateway's maverick Chair and CEO Ted Waitt dressed up as Robin Hood; another portrays him as a poker player in an Old West saloon, beating the pants off his competitors; yet another has Gateway employees dressed as hippies in a VW microbus, advocating computing "power to the people." My favorite shows Julius Caesar sitting on a heavenly cloud shortly after his assassination, drinking out of a Gateway coffee mug and musing, "Sometimes it's hard to know who to trust – especially in the competitive computer business."

Waitt designed the early ads himself; they're still done entirely in-house, using Gateway workers as models. The company operates in a defiantly personal, down-home style, no different from when it started out eight years ago in a red barn on the Waitt family's cattle ranch. The Gateway mascot is a cow. Gateway systems are shipped in boxes that are mottled black and white – like Holsteins. Even the big, modern, main building at Gateway is painted like a cow.

But the gross revenues are hardly bovine. Selling computers entirely by mail order, Gateway is now in the Fortune 500 and has achieved growth that's phenomenal even by the standards of the industry (see performance chart, next page).

Two years ago, the company established a factory in Ireland to pry open the European market. Waitt now says he's aiming for nothing less than first place among PC-compatible manufacturers. Currently, Compaq, IBM, and Packard Bell are ahead of him; Dell has already been left behind.

How did Waitt manage to sell more than a million units in 1994 while playing the fool? Why has his idiosyncratic company flourished out in the boondocks while hundreds of clone makers have been eaten alive by the ruthless mail-order market? And what happens when those wacky ads start losing their novelty value and everyone who wants a Gateway PC has already bought one?

"Economical" is the polite term for Gateway's offices. "Ruthlessly cheap" might be more accurate. Big, ugly, industrial air-conditioning units stick out of the corrugated metal wall beside the unobtrusive main entrance, and the lobby is a bare box. There are a couple of couches, a couple of plants in tubs, some computers on Formica display tables, and two ramshackle coat racks that look as if they were dragged in from a garage sale. Visitors in immaculate business attire arrive here in the early morning like suitors courting a wealthy débutante, but the young, shaggy-haired Gateway employees who come

North Sioux City is a tiny community, dwarfed by the flat, white winter wasteland of South Dakota. You could drive through and hardly notice it. But you'd notice Gateway 2000, a couple of two-story buildings with white, ribbed metal walls, like utilitarian trailer homes, a quarter-mile long.

Charles Platt (cp@panix.com) *writes science fiction books and science articles. His most recent work is* The Silicon Man. *He writes frequently for* Wired.

The Gateway mascot is a cow. Gateway systems are shipped in boxes that are mottled black and white. But gross revenues of $2.7 billion are hardly bovine. Gateway is now in the Fortune 500 and has achieved growth that's phenomenal in an industry accustomed to phenomena.

wandering out to meet them look like mall rats in their faded jeans, dirty sneakers, and T-shirts.

Michelle Gjerde, of the press relations staff, seems to be the only Gatewayite who feels an obligation to dress well. She takes me to the assembly building, where she introduces me to a guy named Shane Hartnett. Shane is only 24, he's been working at Gateway since he was 17, and he's still taking college evening classes in business studies. Meanwhile, he supervises the entire Gateway manufacturing operation.

Big cartons containing motherboards, ribbon cables, and disk drives enter the receiving area from trucks outside. The cartons are inspected and stacked on enormous steel shelves that rise 30 feet above the polished concrete floor. Orange-tinted high-pressure sodium lamps illuminate this 250,000-square-foot area, which looks like the warehouse in the final shot of *Raiders of the Lost Ark*; but the inventory of most parts lasts only five days, at most.

From the warehouse, parts are shifted to the assembly area. To laid-back rhythms of country music, as many as 32 teams of 25 workers run their own mini-assembly lines, Japanese-style. Kids in sweat shirts and jeans seem relaxed and cheerful as they use electric screwdrivers, building PCs by putting together motherboards, power supplies, and disk drives. They make it look as simple as, say, installing a new car stereo.

To laid-back rhythms of country music, as many as 32 teams of 25 workers run their own mini-assembly lines, Japanese style.

Gateway never builds a computer until someone orders it, and every system is custom-configured. After assembly, the units are hooked up for automated testing and software installation, then moved on conveyors to the shipping area where they are packed in black-and-white "cow boxes" and rolled onto big rigs owned by United Parcel Service. The trucks have to travel 100 miles to Omaha, Nebraska, to reach the nearest airport that's big enough for jet service.

"It's a fairly simple process," says Shane. "Really, it's more of an assembly operation than a manufacturing operation."

In fact, Gateway doesn't manufacture anything. It buys a bunch of ready-made components, screws 'em into a case, and ships 'em out. If it's really that simple, why isn't everyone doing it?

"We run what we call a virtual engineering organization," says Tony Olson, a quiet, methodical man who is director of engineering. "We go out and see what's being done, and we decide which standard is going to become dominant."

On the basis of this research, and guesswork – Olson's people specify every detail of a new computer from the chip set to the keyboard layout. After that, they get somebody else to do the fabrication. In the case of "Liberty," a new Gateway laptop with an oversize 10.4-inch color screen, Gateway drew up the specs, then got Sharp to make the screen and Sanyo to manufacture the computer.

By delegating the manufacturing chores, Gateway leaves itself with only four things to think about: design, advertising, selling, and predicting the market. This last factor is probably the most crucial. But in a fast-changing industry ruled by fickle public taste on one side and unpredictable giants such as Intel and Microsoft on the other, how can Gateway possibly plan ahead?

"We maintain multiple road maps here," says Tom Grueskin, who is currently responsible for companywide implementation of Windows 95. "There are people trying to plot future paths in software, or operating systems, or hard drives, so when we want to design a new product, we have a list of all the alternatives."

Shrewd, bottom-line-oriented, and well-educated, Grueskin, at 32, is one of the elder statesmen at Gateway. "In school I was a finance guy," he says. "Then I worked for a baking company and sold institutional croutons. I was so embarrassed about that job; I hated telling people what I did. Then I went out to Ted's ranch, and there were no locks on the doors, a couple of cars out front, a UPS truck, and a couple of dogs running around. When I started officially, we had 40 employees – and we did our first $2 million month."

Grueskin says that Gateway makes a lot of its decisions based on customer feedback. "Because we only sell direct, we're hardwired to the market. When we're doing something our customers don't like, we know it instantly. We have an active staff doing market research, calling our customers every day. We have surveys that run all the time."

Does he foresee eventual market saturation?

"In the United States," he says, "only about one-third of households have PCs. As large as the PC industry is right now, over the next 10 years, the penetration into households will increase. Also, the replacement market will not go away. A lot of our customers are replacing their PCs every three years."

There's a problem, though, in selling to a broadening audience of nontechnical users. Gateway is the only source of information for its own products. As PCs become more complex, incompatibilities become more common, and consumers need more help. Gateway was savagely criticized by *InfoWorld* beginning in 1993 for failing to keep up with demands for tech support; even now, the Gateway newsgroup on Usenet contains hundreds of complaints from people who want support and can't get it.

Grueskin wearily acknowledges this, but claims that customer service has been restructured. "We're starting to see some significant improvements," he says. "By the time your article is in print, a lot of this will finally be behind us."

Well, maybe. Gateway currently has more than a thousand people giving various levels of telephone help from three different US locations (in North Sioux City and Sioux Falls in South Dakota as well as in Kansas City,

Shane Hartnett (left) is 24. He's been working at Gateway since he was 17, and he's now taking evening classes in business studies. Meanwhile, he supervises the entire Gateway manufacturing operation.

Howard "Swede" Servine (above, at left) and Milo "Mike" Bergeson spent their lives working at the local hog-processing plant, using razor-sharp knives to scrape carcasses. The plant processed 800 hogs an hour.

Ted Waitt with some of the regulars at Jim's I-29 Liquor & Lounge: "This whole business is in its adolescence. Right now, we're just like a 14-year-old kid who stole the keys from Mom and Dad so he could do some really crazy stuff. There are all kinds of challenges still ahead."

Missouri). Even so, the 800- number is often busy, and the fax-back service can take two or three days.

Here in North Sioux City, incoming calls are fielded in a vast ground-floor area divided into hundreds of 5-foot cubicles, each containing a representative with a headset and a video monitor. At random, I stop and talk to Sheylee Walden, who tells me she's been at Gateway for about six months. She cheerfully agrees that the people who call her tend to be impatient and are sometimes mad as hell ("hot customers," as Gateway terms them), but she seems quite happy to cope with 100 to 120 of these calls per day. "I can usually calm a hot customer down," she says with a shrug and a smile. And all around me, in the other little cubicles, Sheylee's co-workers seem equally, oddly content with their wearying tasks.

Technical support is on another floor subdivided into hundreds more cubicles. There's a two-tier system here, with higher-level support provided for corporate customers and lower-level support for private users. Mark Krapfl is in the latter section. "When the customer calls in," he says, "I'll more'n likely click on this." He points to his video monitor, where there's a list of the "top 50 issues" afflicting Gateway system owners. "For instance," he goes on, "if they have a CD-ROM problem, this will tell me some of the things it most likely is."

If one of the likely problems matches the customer's actual problem, Mark clicks again, and some text appears, giving the solution. It seems to me that his job consists of reading relevant pages from an instruction manual to customers who, for some reason, haven't read it themselves.

"Basically, that's about it," he agrees. "But a lot of times, the customers do know how to fix the problem; they just want someone at Gateway to hold their hands and tell them they're right."

Mark, like Sheylee, seems very upbeat, very happy to go through this repetitive daily ritual. OK, I guess it beats skinning hogs – but I'm beginning to get the impression that Gateway employees aren't just counting their blessings. They seem like true believers participating in an exciting adventure. Soviet socialism was supposed to work this way, with smiling, clear-eyed workers forgoing luxuries and cheerfully pulling together for the greater good. How has Gateway achieved the kind of team spirit that Karl Marx could only dream of?

The spirit is strongest in the sales department. Todd Osborn, vice president for sales, grabs a microphone that is always ready. "Attention all sales!" His voice booms across another vast array of cubicles beneath an unfinished ceiling of galvanized sheeting, air ducts, and steel beams. "The next person to sell two 75s with quads gets a hundred dollars!"

He's talking about 75-MHz Pentium systems with quad-speed CD-ROMs. Selling at Gateway is not just a matter of quoting a system price; it's a holy crusade. Sitting in his windowless office, which is about as glamorous as a shoe box and only slightly larger, Osborn lists special incentives that motivate sales people who are paid almost entirely on a commission basis. "We have an achiever award," he tells me, "a rookie-of-the-month award, a plaque, and $25 or $50 in cash – you get recognized in front of the group, maybe three hundred reps. It's amazing what that does. Then the person who sells the most Pentiums gets a trip to Omaha and dinner for two. In a monthlong contest, you might win a trip to Florida or a cruise for two." He looks at me with powerful sincerity. "I try to instill in our employees the idea that if you've had dreams, you can make them happen here. You really can."

Todd breaks off as he notices that my laptop is a Compaq. For a moment, he looks pained, like a true believer encountering someone who has not yet been saved.

Before he has a chance to redeem me, I ask him another question. About how much money does a typical salesperson make?

"Thirty to forty thousand, on average. Some make six figures. Everyone's very ambitious. They all want more. You see, we're trying to make a dynasty here. But it takes a lot of hard work, and personally, I still feel we're at the ground floor."

He claims that the whole operation is based on customer satisfaction. "You're not going to be dissatisfied when I sell you a system. You're not going to call me six months from now and say, 'Todd, why didn't you sell me the quad CD?' because – I already did! What you're going to do is call me and say 'Todd, my buddy wants a system just like mine.' More than 45 percent of our business comes from referrals." He shakes his head in awe of the statistic. "That's just amazing."

"We run what we call a virtual engineering organization," says Tony Olson, director of engineering. "We go out and see what's being done, and we decide which standard will be dominant."

I ask where he gets his supply of positivism.

"I've been an achiever all my life. I set myself lofty goals, and this company is a beautiful platform for that sort of person. If you like what you do and have a goal and a plan, if you want it bad enough" – he spreads his hands – "you can do anything."

In every department at Gateway, I've heard Ted Waitt's name mentioned in casual conversation. Everyone refers to him as "Ted," and they almost always speak of him warmly. I'm assuming that he's the main source of the feel-good spirit that seems to permeate every level of the company.

The executive offices deviate just a little from the bare utilitarian look that prevails in the rest of the building. Glass walls surround the waiting area, and GATEWAY 2000 is spelled out in white letters behind the reception desk. Ornamental wooden cow sculptures stand beside two comfortable chairs. 215 ►

WHAT THE HELL YOU STARIN' AT?

It's edgy, outrageous, smart – and as "underground" as TV gets. Now in its second season, *Duckman* redefines animation even more than *The Simpsons* did. Think Norman Rockwell on acid, or Walt Disney meets Robert Crumb. By Rogier van Bakel

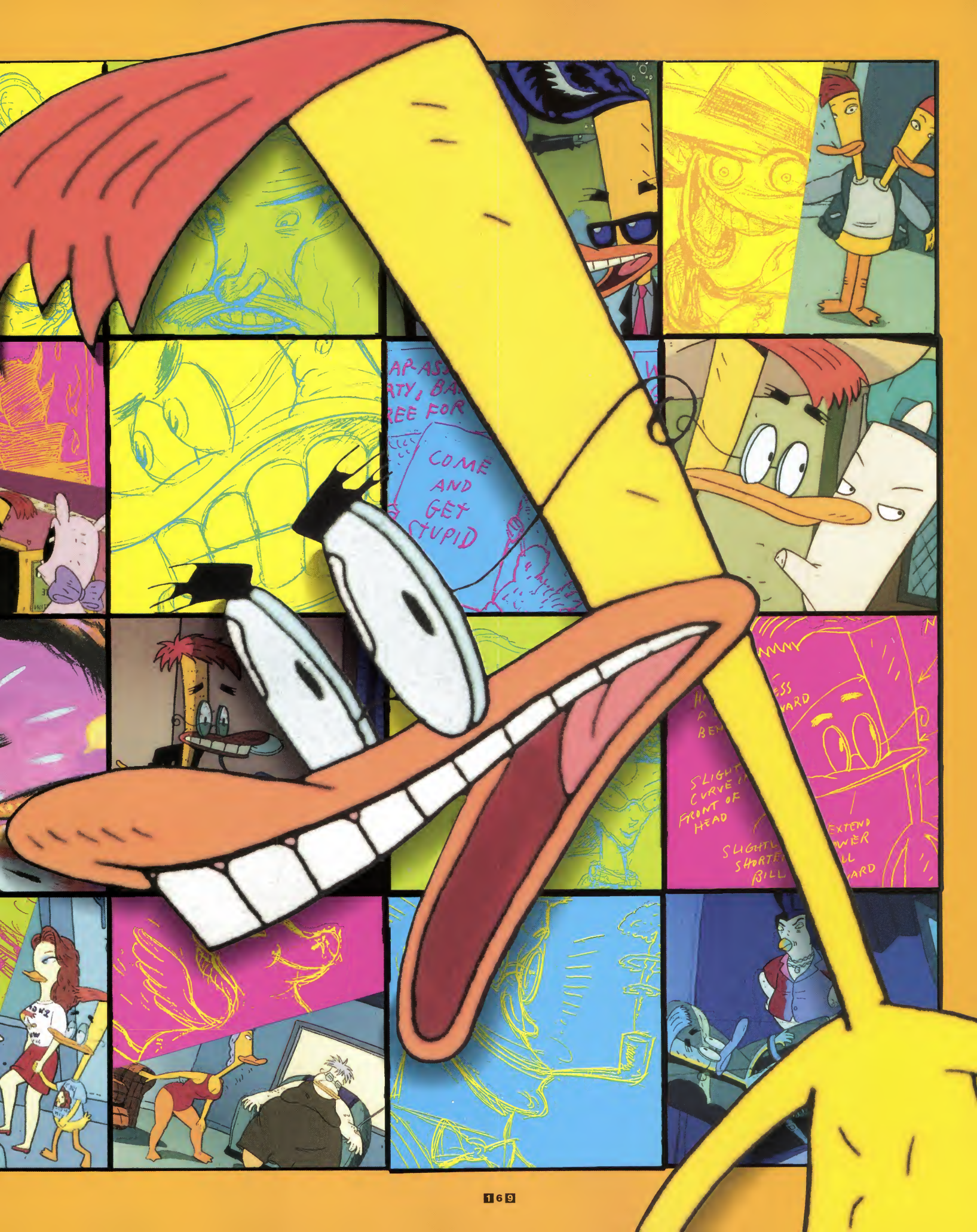
This is no ordinary private duck. Scuse me – *dick*.

You may have seen him romping around USA Network on Saturday nights. He's not the superhero type, not at all the gallant gent whose suave smile sweeps women off their feet and makes his enemies' skin crawl. In fact, this cranky li'l critter often takes offense at the merest glance an innocent stranger casts his way – "What the hell you starin' at?" being his signature line. Honest, this is one weird sumbich. Skinny, with eyebrows that hover restlessly over the rims of his glasses. Anybody looking to hire a two-bit gumshoe who thinks he's the center of the universe, look no further. Duckman fits the bill.

Speaking of beaks, Duckman agonizes over the size of *his* ornithological protuberance the way most men are said to be anxious about – well, you get the idea. More importantly, the feathered fella continually frets about a changing culture that no longer lets him do what he does best: be a male chauvinist duck with a chip the size of Saskatchewan on his shoulder. He's a red-steak-and-two-fingers-of-gin kind of guy with a deep love of theater and the cinema – as long as the stage production is *The Busty Bikini Babefest* and the movie is *Hannah Does Her Sisters*. To his credit, Duckman loves his three sons (two of whom share one body), and he dearly misses his dead wife (he has forgiven her for willing the kids to her sister Bernice, a shrewish Thigh-Master addict who attempts to run Duckman's household like a boot camp).

When all is said and done, Duckman genuinely wants to make the world a better place. No, really. But before he can express his affections, or act on his confused idealism, he invariably gets sidetracked by the dark forces that rule his universe. More often than not, these forces wear skimpy dresses and high heels.

And yet, for all his shortcomings, Duckman generally evokes a weary kind of compassion. He is Everyduck and D-FENS rolled into one, attacking life's trepidations with a mixture of defiance and despair. He is imperfect – strike that, he can be positively *insane* – but his


COME AND GET STUPID

attempts at valor and heroism are touching in their inadequacy. His lack of true courage is outstripped only by his maniacal drive to prove himself worthy of self-respect and the world's admiration.

"One of the things we immediately liked about Duckman was his Sisyphus quality," says Ron Osborn, who, with Jeff Reno, is the head writer and executive producer of the show. "No matter what, he gets up every morning and pushes the rock up the hill, and the rock rolls over him. But he never quits. He just keeps pushing that damn rock."

Rough 'n' dirty

Duckman was born nine years ago, when San Diego illustrator Everett Peck looked at a piece of paper on which he had been doodling, and found he had given birth to a ranting duck with large teeth and a mop of tomato-red hair. But it took several more years for Duckman to come to life, at least in any public sense. In the fall of 1990, Dark Horse Comics published the first *Duckman* comic book. The cover contained a faux warning sticker that read "NOTE: This ain't no comic for you fantasy slobs with pointed ears. This comic is for the hard-workin' joe that takes it in the butt from the I.R.S. every year – like clockwork."

Duckman was born nine years ago when San Diego illustrator Everett Peck turned a doodle into a ranting duck.

Inside were embryonic forms of Peck humor. There's the drawing of Duckman in his car, having just backed over his sons, Charles and Mambo, whose heads protrude from under the rear fender. Yells Dad: "How many times have I told you two fartballs not to play in the driveway?! Now I'm gonna be late for work!" There's also the scene where the mad mallard sits in a coffee shop, smoking a cigarette. A polite, bucktoothed little hare approaches him, murmuring: "Scuse me ... Thanks for not smoking." Whereupon Duckman delivers a nasty uppercut to his gadfly's chin, replying coldly: "Thanks for being unconscious." All this executed in black ink, in a rough 'n' dirty style that few would have recognized as network TV material.

Enter Gabor Csupo.

The Hungarian-born animator, who has the slightly unkempt, handsome look of a storybook revolutionary and a heavy Slavic accent to boot, was disappointed by the quality of American animation. After he left his country in 1975 with little more than a change of clothes and 500 record albums, he found work in Sweden, then in Hollywood. Tinseltown intrigued and puzzled him. He couldn't understand why "mostly everyone was imitating the already successful style of Disney and Warner Bros."

Csupo (pronounced CHEW-poh) envisioned a community of animation artists bent on pushing the envelope, a company of pioneers who would forego "cookie-cutter art, the stuff with the big noses and the round eyes." After a successful period of freelancing, he and his wife, American graphic artist Arlene Klasky, started their own animation studio in 1982. Klasky/Csupo Productions soon began recruiting artists from the US and Europe.

"The stranger and the more bizarre they draw, the more we love them," Csupo grins. No surprise, then, that he and Peck were a match made in heaven. "To me, it was easy; I saw the humor of Duckman, the charm, the craziness," Csupo says happily, somehow managing to avoid any sign of arrogance. "I knew immediately that it would make a great cartoon."

Perhaps partly on the strength of other animation shows that Klasky/Csupo had worked on or was developing (among them *Rugrats*, *The Simpsons*, and *Aaahh!!! Real Monsters*), Fox TV responded favorably to the studio's sales pitch, and commissioned a *Duckman* pilot. But USA Network, a relatively obscure cable channel co-owned by Paramount and Universal, went Fox one better. In need of a strong signature show, USA gave Peck and Klasky/Csupo the go-ahead for 13 episodes. The second season – another 13 weekly Saturday night shows – started in March, with reruns scheduled throughout the rest of 1995. Thirteen more original shows are to follow next year.

Duckman is the boldest piece of social satire to hit the tube in years, matched lovingly with delightful music fragments from the work of the late Frank Zappa. Though the show is strong in the 18-to-30 age group, baby boomers Reno and Osborn see no reason why people their own age wouldn't tune in to *Duckman* (provided prospective viewers can find the low-profile USA Network on their cable menu). Robert Goldberg, the TV critic for *The Wall Street Journal* – not exactly a Gen-X rag – apparently agrees. He proclaimed *Duckman* one of 1994's best shows: "*Duckman* is a fuzzy yellow Angst machine with hip, wry humor to spare. A very adult, prime-time cartoon that blows away competitors like *The Critic* and *The Simpsons*."

World Wide Webfoot

The adventures of His Webfootedness have been sold to TV stations in the Netherlands, Belgium, Germany, Spain, France, Greece, and the United Kingdom. Now, millions of viewers in North America and Europe have fallen in love with Duckman (the voice of Jason Alexander, best known as George on *Seinfeld*) and his fellow misfits. Adding to the show's international cult status is an Internet newsgroup dedicated exclusively to the crime-fighting waterfowl (alt.tv.duckman); and a World Wide Web site with news, plot summaries, sound files, and cast lists. *(http://bluejay.creighton.edu/~jduche/duckman.html).*

Many participants in the newsgroup are fond of Duckman's dimwitted son Ajax (the voice of Dweezil Zappa), who is 15 but hasn't mastered the four-slice toaster, and occasionally forgets that he doesn't have to knock on the door of his own bedroom before entering. Others favor Cornfed, Duckman's loyal sidekick, and Pig Friday, whose deep, monotonous baritone (a stellar performance by Gregg Berger) vibrates with the sexiest timbre this side of Barry White. Many are annoyed with Fluffy and Uranus

GABOR EKECS

JCKMAN
DUCKMAN
WHAT THE HELL YOU STARIN' AT?!
ARCADE

ly hypercorrect office assistants always spring back to life after "Mr. Duckman," their lord and master, routinely impales them on coat hooks or feeds them through a paper shredder.

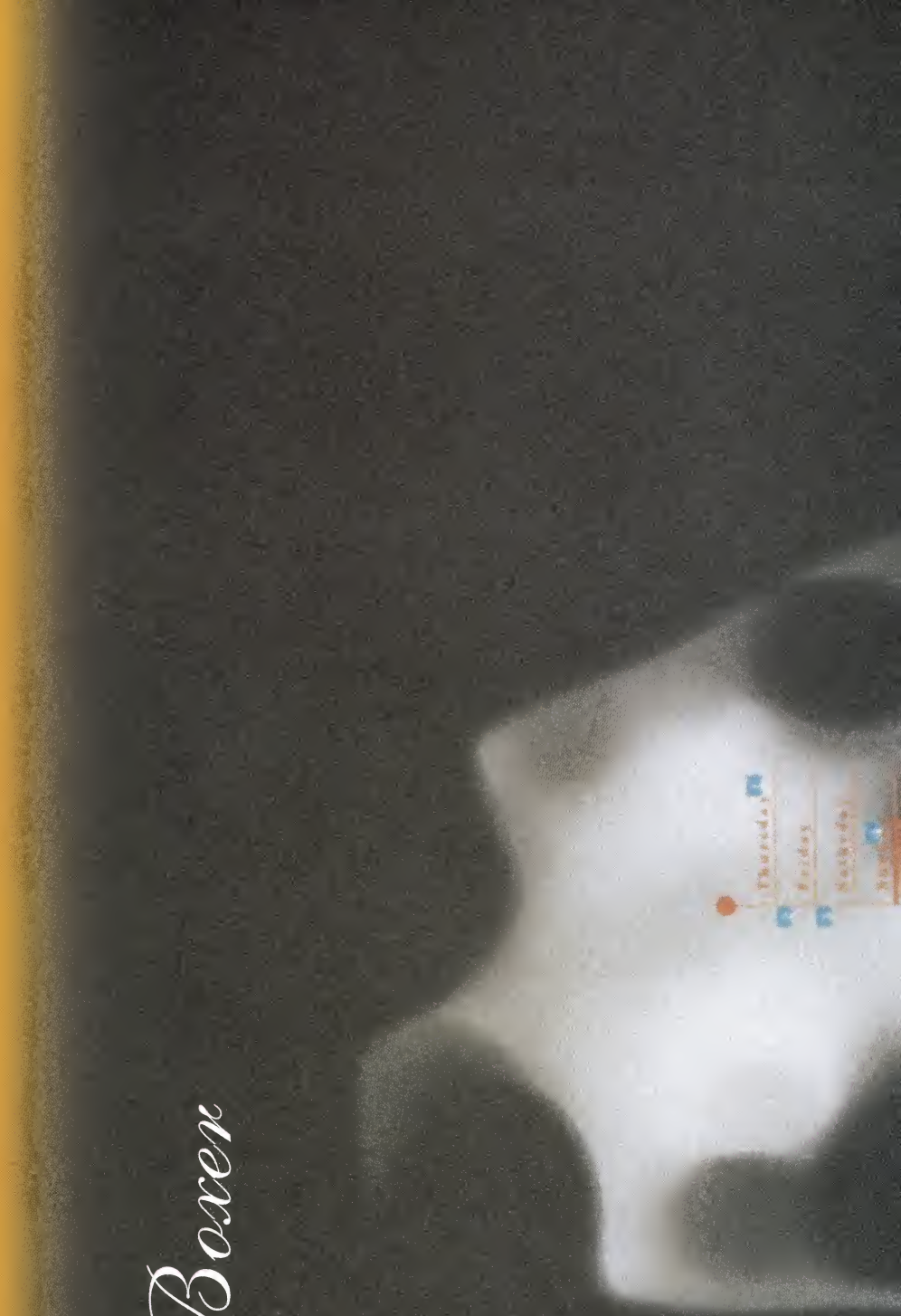
The producers insisted on hiring "real actors" to bring the show's characters to life, "instead of people with funny voices." (The cast also includes Nancy Travis as Bernice, Dana Hill as Charles, and E.G. Daily as Mambo). "Duckman is an extremely angry character, but he is also very vulnerable," explains writer/producer Jeff Reno, who, like Ron Osborn and all the other top creative people working on the show, sports jeans and a beard. "He gets shit on left and right. He shits on others, too, but he definitely gets it back worse than he gives it out. You need an actor who can play both sides pretty well."

There's a delicate balance, Reno believes, between Duckman the victim and Duckman the ranting cynic. "We talked about that for a long time before we started writing the first scripts. You can't have a main character who's too unlikable." For instance, the joke about Duckman running over his offspring with his car, and then complaining that this will make him late for work, wouldn't work well on TV. On the show, Duckman would at least apologize or feel remorse afterward.

"We had to ask ourselves, How bad a father can he be before he becomes so bad that it's not funny anymore?" says Osborn. "At the same time, we remain serious about doing an animated underground show that captures the rawness of the original comic. We wanted to steer away from the stuff that gives you the warm fuzzies, the stuff with the obligatory family group hug at the end. Which is why I'm pretty sure we will never win an Emmy or a CableACE Award, even though we've been nominated for both. We make fun of the warm fuzzies. That's probably a little too disquieting for most network-think."

That's testicles to you, scumbag

Not that Reno and Osborn are strangers to the more traditional shows: they've worked on such eminently palatable fare as Mork and Mindy and Moonlighting. But Duckman is their first foray into adult animation, and they cherish the artistic freedom that comes with it. Says Osborn: "If this were a live-action show, I think the jokes would take on a tragic quality. The dysfunctional elements in the family would be at too high a pitch to watch comfortably. Animation gives you this patina, this other-worldliness, that distances you a little bit from the darkness, but still allows you to be dark." 216►



Jewel Boxer

One of the few jobs Vaughan Oliver could find after design school was at a London company that fashioned labels for foods: Seagram's liquors, Quaker Oats, and Heinz canned beans. Now one of Britain's premier designers, Oliver is grateful for the hours he spent arranging letters around photographs of porridge.

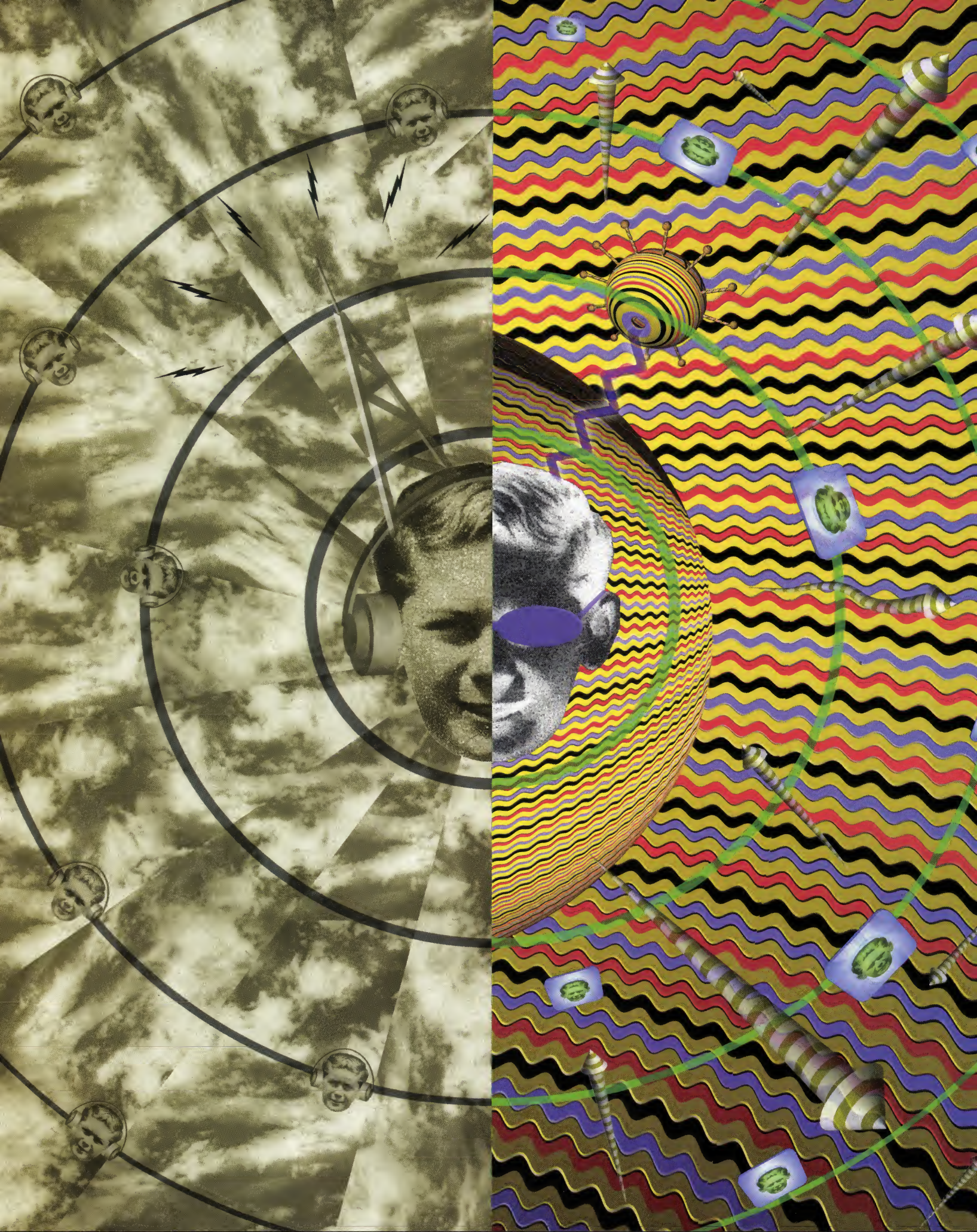
"It made me look at type for the first time," says the unassuming native of northeast England. "I started to see its potential." Oliver's signature has since been type – Arabic numerals, Chinese characters, and calligraphy – which he layers with photographic images. Most of his work graces the covers of LPs and CDs: he crafts them only after immersing himself in the music and conjuring up an image.

Oliver became a music-label designer after he "banged into a chap called Ivo in a record store." Ivo Watts-Russell was starting an indie label, 4AD, and Oliver joined him to produce covers with more artistry than the usual group picture of the band. Since 1988, he and three assistants at his studio, v23, have put together album covers and posters for The Breeders, Modern English, and The Pixies.

But Oliver is tiring of his work with CDs and what he calls their "crappy little plastic cases. I can't be intricate and detailed like I could with records," he says. In the past few years, he has taken on a variety of projects: he recently collaborated with Japanese artist Shinro Ohtake on a book depicting Ohtake's dreams and is devising covers for *huH*, a Santa Monica, California-based music magazine.

Oliver's LP and CD designs are part of a permanent exhibit at the Victoria & Albert Museum in London. The covers have also been shown in Tokyo, Osaka, LA, and Nantes, France. But Oliver is ambivalent about the exhibitions. "They divorce the image from the music. Ideally, you're listening to the music and looking at the image. You're experiencing them together." – *Mandy Erickson*

v23: +44 (181) 870 9724



Déjà Vu All Over Again

**It's many-to-many communication.
It's making possible citizen control of a remote political process.
It's creating a new culture and economy.**

**Sound familiar?
It was the hype surrounding a technological revolution
that occurred 75 years ago – radio.
Is there a lesson here for the Internet?** By Todd Lappin

In the beginning, when the frontier was wide open, 12-year-old Maynard Mack wanted to see what the fuss was all about.

He'd heard about the hip new technology. He'd been told about the miracles the future would bring. And he'd picked up a few copies of the latest specialty magazines. But the prefab boxes he saw advertised in those pages were hard to come by and far too expensive for a country kid from Ohio. "They may have been available for sale somewhere, but I certainly never saw them," Maynard says.

So he assembled his equipment on a wing and a prayer. Yet even as he was entranced by the new medium, Maynard – like thousands of other amateurs – didn't know what would become of his efforts.

The high-powered corporate executives didn't know either, but they were sure they wanted a piece of the action. The pundits didn't know, despite their predictions that the new technology would bring the blessings of Knowledge, Culture, and Democracy into every home across the land. And the politicians in Washington didn't know, though they recognized that the frontier was developing so quickly that hordes of voters would soon be breathing down their necks.

They all knew they were onto something.

"Let us not forget that the value of this great system does not lie primarily in its extent or even in its efficiency. Its worth depends on the use that is made of it.... For the first time in human history we have available to us the ability to communicate simultaneously with millions of our fellowmen, to furnish entertainment, instruction, widening vision of national problems and national events. An obligation rests on us to see that it is devoted to real service and to develop the material that is transmitted into that which is really worthwhile."

Mitch Kapor? Newt Gingrich? Al Gore? Alvin Toffler?

Nope. Herbert Hoover, speaking in 1924 as the Secretary of Commerce. And the "great system"? Not the Internet. Nor the Infobahn. It was radio. Plain ol' broadcast radio.

In 1922, the "radio craze" was taking the country by storm. Journalists wrote ecstatic articles describing the newest developments in wireless technology. Politicians hailed radio as the latest product of American entrepreneurial genius. The term "broadcasting" – previously used by farmers to describe the "act or process of scattering seeds" – was rapidly becoming a household word, complete with all its contemporary mass media connotations. Radio stations were popping up like dandelions across the land. Meanwhile, back in Ohio, young Maynard Mack kept track of these advances by poring over the pages of the nearest big-city newspaper, Cleveland's *The Plain Dealer.*

Maynard didn't want to miss out on the fun. So he gathered together a mad scientist's assortment of hardware – a few scraps of plywood, a couple yards of wire, two or three control knobs, a cylindrical oatmeal carton, and a surplus vacuum tube he got from the chemistry department of the local college – and went to work building himself a radio receiver based on a set of plans he'd seen in a magazine.

That's what you did if you were

Todd Lappin (toddsl@aol.com) *listens to NPR and Rush Limbaugh on his way to the University of California, Berkeley Graduate School of Journalism.*

ILLUSTRATION: JOHN HERSEY

an inquisitive kid growing up in the early 1920s, says Maynard, now a retired Yale University literature professor. You went cruising along the frontier of high-tech electronic communications. In other words, you built a crude, homemade radio receiver, strapped on a clunky set of headphones, and tried to listen to the signals being exchanged through the ether. Maynard remembers that sometimes he'd hear nothing but static for hours on end. Sometimes he'd, struggle to decipher a few stray dots and dashes of Morse code conversation hammered out by other amateur radio enthusiasts on their jury-rigged transmitters. And when he really struck gold, he'd manage to catch one of the nighttime music or news programs emanating from KDKA in Pittsburgh, Pennsylvania, one of the nation's first radio-broadcast stations. "Back then, you had to make your own entertainment," Maynard muses.

thing. It's about riding the wave. Actualizing tomorrow. Plugging in. Checking it out. Getting the scoop on the Next Big Something.

Today's Next Big Something is so wrapped in hype it's tough to see what's really going on. And as the hype solidifies into conventional wisdom, almost anyone can recite the narrative. It goes like this: The online revolution is happening now. The revolution will facilitate interaction through the digital exchange of information. By exchanging information, we grow closer as a community. By exchanging information, we become free. Blah, blah, blah.

But what if conventional wisdom is wrong? What if the crystal-ball narrative doesn't turn out as planned? What if, a decade or so from now, we wake up to find that the digisphere has been overrun by swarms of inane mass marketeers – people who believe that "interacting" is something you do with a set-top box that provides

ing, high-tech gloss.

Since the early 1920s, a science fiction writer's dreamscape of new communications technologies have come along to nudge radio from the spotlight. In the 1950s, we got black-and-white televisions. In the 1960s, color television. In the 1970s, cable. Then came infatuation with VCRs. Satellite dishes. Cellular telephones. And now we've got PCs with online hookups.

The glitter may be gone, but broadcast radio is alive and well. After all, radios are a fixture in 98 percent of American homes and in almost as many automobiles. Radio broadcasting remains a staple of our mass-media diet. We listen to it while getting dressed in the morning. During the daily commute. At work. Or while doing chores around the house. And as we continue to tune in, we also transform radio's most adept practitioners into national celebrities. Rush, Garri-

This isn't the first time a new medium has promised a

If Maynard Mack had been born 60 years later – in 1970 instead of 1910 – he still might have kept busy manufacturing his own entertainment. But in 1982, he would have been staying up late to construct a Frankenclone PC up in his bedroom. And nowadays, he'd probably be puttering around with motherboards and high-speed modems instead of all those goofy radio parts. Maybe he'd spend hours surfing the Web, skimming Usenet groups, or loitering in America Online chat rooms. That's what you do if you're an inquisitive kid growing up in the 1990s. You cruise along the frontier of high-tech electronic communications. You get wired, you go online, and you explore the world of activity unfolding in cyberspace. But when Maynard Mack was growing up, the goal was to get wireless.

Get wired! Get wireless! They may sound contradictory, but historically, they mean the same

only an endless stream of movies-on-demand, bargains overflowing from virtual shopping malls, and spiffy videogames?

It has happened before.

This isn't the first time a new medium has come along, promising to radically transform the way we relate to one another. It isn't even the first time a fellowship of amateur trailblazers has led the charge across the new media hinterland. Radio started out the same way. It was a truly interactive medium. It was user-dominated and user-controlled. But gradually, as the airwaves became popular, that precious interactivity was lost. We need to understand how that happened.

We've come a long way since the early 1920s – so far that it's difficult to imagine a time when the radios now on our bed tables and in the dashboards of our cars were worshipped as objects of cultic fascination and mystery. Radio long ago lost its shimmer-

son, and Howard, to name a few.

But 75 years ago, there was no such thing as a radio celebrity. Radio sets were an expensive novelty. In 1922, for example, when less than 0.2 percent of American households owned a radio receiver, the average radio set cost a whopping 50 bucks. (At the time, US$50 was about 2 percent of an average American family's annual household income – which means that a radio would have set you back about as much as a well-equipped home computer today.) Few anticipated that listening to the radio was an activity that would someday appeal to broad segments of the population. Seventy-five years ago, radio broadcasting resembled the PC industry during the days of Jobs and Wozniak – it was an infant technology struggling to establish a niche for itself in the food chain of modern mass communications.

Yet even during those early days, enough people were listen-

ing for the medium to catch on.

Radio listeners fell into two categories. First, there were the professionals. These were people who worked for companies that sought to turn a profit from wireless technology – business giants like General Electric Corp., Westinghouse Electric and Manufacturing Corp., the American Telephone and Telegraph Company, and the newly formed Radio Corporation of America (RCA). The men at the helm of these corporations thought radio had only limited consumer appeal. As if mesmerized by the old media paradigm of the telephone, they convinced themselves that the future of wireless radio lay in the direction of targeted, point-to-point communications. Specifically, they concluded that radio was naturally suited for use in environments where wired telephone networks were either too expensive or too impractical to operate. Thus the professionals went to market offering well-heeled clients premium services such as ship-to-shore maritime communication and intercontinental messaging services.

Then there were the amateurs, who didn't care much about radio's profit-making potential. They got involved with wireless because they were fascinated by the new technology. The amateurs were hackers, basically – hobbyists, tinkerers, and techno-fetishists who huddled in their garages, attics, basements, and woodsheds to experience the wondrous possibilities of the latest communications miracle. Unlike the professionals, the amateurs didn't view radio exclusively as a tool for point-to-point communications. They also used it to communicate with anyone who happened to be listening.

The airwaves were wide open – more or less. The professionals had ignored the mass-market potential of wireless technology, leaving plenty of room for amateur enthusiasts to stake their claims along the bandwidth spectrum. Licensing requirements issued by the Department of Commerce were reasonably easy to meet for anyone who wanted to set up a transmitter. (Proficiency in Morse code was the most daunting requirement.) And once you got on the bandwagon, there was a whole community of like-minded early enthusiasts who were eager to welcome you aboard. It wasn't fancy, but then again, neither was Arpanet back in the days when Vint Cerf was calling the shots.

In his 1928 history, *The Electric Word: The Rise of Radio,* author Paul Schubert describes what it was like to be one of those primordial broadcasters in 1917, the period just prior to America's entry into World War I. "Before the war, " Schubert writes, "there had been some five thousand licensed radio amateurs scattered throughout the nation, most of them youngsters. Limitations on power and wavelength had made the achievement of great distances generally impossible by them, but through their organization, The American Radio Relay League, they had been able to exchange communications from coast to coast. And they had filled one most important place in radio activities – they served as a cooperating audience to the serious experimenters who were striving to perfect the more subtle utilizations of the art."

Just after World War I, the radio ranks swelled even further, as thousands of Army-trained radio operators were demobilized. At the time, transmitting equipment was confusing, temperamental, and hard to come by, but figuring out how to get it all together and make it work was part of the sport (as anyone who's ever spent a few hours wrestling with initialization strings for a SLIP connection understands). And in the end, it was worth the effort. After all, there was nothing like the intoxicating rush that came from connecting with strangers in ways that had never been possible before.

"I think I can sympathize with and understand the passion of the wireless amateur who goes fishing in the electrical ocean, hoping to draw a congenial spirit out of the unknown depths," a contributor wrote in a 1924 edition of *Radio Broadcast* magazine. "This type of amateur sits in his laboratory and sends out a little message, baited with 10 watts, say, and then listens with a beating heart for a response from the void. Usually his cry is in vain. He draws a blank. But sometimes he hears, mixed up with his heart throbs, a reply from another 'brass pounder' calling him by his sign letters. What a thrill!"

Tuning in was something that was done actively – not passively. For the thousands of amateurs who owned radio transmitters, the ether crackled to life as a two-way communications medium, whenever they strapped on headphones to begin tapping out Morse code or speaking into the microphone. Meanwhile, there were thousands more, like Maynard Mack, who chose the easier path – setting up a receiving outfit without the transmitter. But they too were encouraged to get in on all the interactive programming by sending amateur broadcasters "Applause Cards" – postcards confirming receipt of their transmissions. "Although not a hundred miles from N.Y. I must write to tell you how I heard your signals last night," a Connecticut listener scribbled after hearing a 1920 broadcast by station 2XB in Manhattan. "I happened to catch a part of the 10:45 period. At 11:15 when I found you were on a longer wavelength than I expected, heard every word beautifully. Monday night we are having a little company to listen to you and if you can acknowledge by a word or two to me, will be more than delighted."

For a while, the amateurs had a pretty good thing going. It was all very nice and ever-so civil. While blazing a path through the airwaves and attracting a growing following among members of the general public, the amateurs built an iconoclastic virtual community within the static-plagued nether world of the broadcast ether. In the early 1920s, it was a community spearheaded by thousands of precocious young Americans who could easily "talk inductance, capacity, impedance, resistance, and the other technical terms with a pretty thorough grasp on their meaning and a good appreciation of their application in radio work," according to *Electrical World* magazine. It was a wireless community that operated according to its own set of rules, protocols, customs, and taboos. Creative experimentation with radio programming was encouraged. Monopolizing bandwidth was considered bad form. And blatant commercialism was completely uncool.

radical transformation of how we relate to each other.

Radio Broadcast magazine was a mouthpiece for the amateurs and the burgeoning broadcast audience. It was also a focal point for the articulation of their values and their interests. *Radio Broadcast* sought to chronicle the ways in which the advent of a new communications medium promised to permanently alter the face of culture and society.

Thumbing through back issues of *Radio Broadcast* is an eye-opening experience: it is startling to discover how much like us our radio precursors were. They spoke with similar enthusiasm and asked many of the same questions. They believed in their new technology, and they believed that it should be 218 ►

digital refusnik

Sven Birkerts believes that technology is leeching the spiritual out of human experience. By Harvey Blume

Wired: You have staked out a radically antidigital, antiwired position. What do you fear most about the new communications technology?

Birkerts: The erosion of presence, the loss of immediacy of engagement, whether person-to-person or person-to-environment. The opposite of presence to me is virtuality, simulation. I see the polarity as central to our time.

When did the changes that worry you begin?

We've had labor-saving devices and inventions all along, of course. What's happening now is that the innovation is coming at a more rapid pace than ever before. We had the telephone, already a great mediation device, both imposing and reducing distance between people. We got used to it. TV came along, causing a kind of crisis in the culture. We accommodated. But at some point in the last 20 years, these things came at such a rate we gave up on accommodation and simply began to accept. We just breathe in technology these days – the whole panoply, everything from phones to answering machines to e-mail to computers to fax.

It's not that these things are necessarily evils. But we don't have the chance to grow into them, to learn their meaning and their measure and their shortcomings, because they are coming at such a rate and in such multiples.

If you were around in 1900, would you have been one of those people, like Mark Twain, who opposed the phone?

Probably. That may be my disposition. Today I'm being driven to a greater sense of dissent just because there's a greater sense of acquiescence everywhere I look. That angers me, drives me to make stronger, more strident assertions to the contrary. In 10 years, I'll probably be walking around in a pelt, with a beard, barefoot and screaming, and they'll lock me away and that will be the end of it.

Why do you think that working with a computer is so much worse than working with a typewriter?

Software represents the tool-making, calculating, analytical side of ourselves. And yet when you sit down to write at the screen – I'm talking about certain kinds of writing – you're trying to break through to the other side.

Don't you think it's fascinating that at the very moment we are learning to write code – code that is comparatively simple – we are also beginning to understand ourselves as DNA-coded beings?

There's a fine line between understanding ourselves as coded and fiddling with the code. When we begin messing around with it too much we eventually exceed some threshold and wind up in an environment where we understand nothing. Having demythified all our myths and demystified all our mysteries, we're going to find the spiritual residue of ourselves in grave condition.

You're good at pointing out the dark side of connectivity. It's true every new technology casts a shadow – the automobile, for example, brings pollution and dependence on oil – but can't you see any of the liberating impact of computers?

Yes.

Yes? Did I hear yes?

Yes, I think there's a steady, inevitable overcoming of human provincialism. We're becoming schooled to larger perspectives. Though it's not always easy to believe, we're going to be more tolerant of diversity and difference. We will grasp a sense of global living in a way we never could before.

You wrote: "By degrees – it is happening year by year, appliance by appliance – we are wiring ourselves to a gigantic hive." But human culture is so fantastically complicated it's hard to imagine us living like social insects, electronic or not.

Pretty soon, every household will be a centered unit that pulls all its elements together into one great communicating pipe organ. At the same time, there has to be a flattening of the human. It's essential to the hive life, which challenges the old terms of what it means to form a life. As everything else in our society becomes streamlined, it becomes harder to resist the trend. Over the generations, people will have increasingly similar lives.

If it's a hive, who is the queen? Is the queen electronic?

There is something in us, possibly our own DNA, that recalls animistic ritual – the fear of night, of the gods who come back in different form on the big screen. If somebody comes along who's a persuasive demagogue and really commands the wires, commands the codes, and is an irresistible presence, I can imagine some dangerous scenarios.

I can also imagine a spiritual leader tapping in and turning those same desires in the other direction. So it's a gamble. Electronic Church or electronic Reich? It could be either.

Some people do better on the phone than in person, don't they? They're more comfortable, less embarrassed. Why not think of viewing online interaction as another possibility for communication?

You're arguing for pluralism: we can have the old but we also can have the new, whereas I say that the new makes it harder to have the old.

We're compelled by invisible collective pressures to move in the direction society is going. I feel I almost have to physically resist going online. There are so many compulsions and expectations to my daily life: Can you send me the disk? Can you do it now? Can you do it tomorrow? Not going online has become a point of principle for me.

So staying offline is an experiment you perform on yourself, a kind of performance art?

A kind of performance art. I've gone in five years from being seen as slightly retrograde to being seen as positively a crank. Five years from now, if I'm still not online it's going to be seen as grandstanding.

You're going to need a doctor's note. What use can *Wired* readers make of your objections? Besides junking their machines, that is.

I don't want people to junk their machines. If I have a mission in talking about this, it is to bring the question out, bring it forward. The last words in my book are "Refuse it." I sound like I'm speaking for the world. But I'm speaking only for myself. I don't tell anyone else to refuse it, only to think about it. ■ ■ ■

Critic Sven Birkerts speaks slowly and searches carefully for his words. He seems almost embarrassed by the antidigital-firebrand role for which he is becoming known. But it's a role he has sought out. It's tough work, his sigh seems to say, but someone's got to do it. Birkerts's opposition to electronic culture – he fears we are making a Faustian bargain, gaining efficiency and connectedness at the price of our souls – is summed up forcefully in his new book, *The Gutenberg Elegies: The Fate of Reading in An Electronic Age* (Faber and Faber).

Just how antidigital is Sven Birkerts? In the attic study he and his wife share in their home just outside of Boston, Birkerts's typewriter is at one end, as far away as possible from a desktop PC. Birkerts and his wife stagger their hours in the study so that she is not disturbed by the noise of his typing – nor he by the spectacle of her word processing.

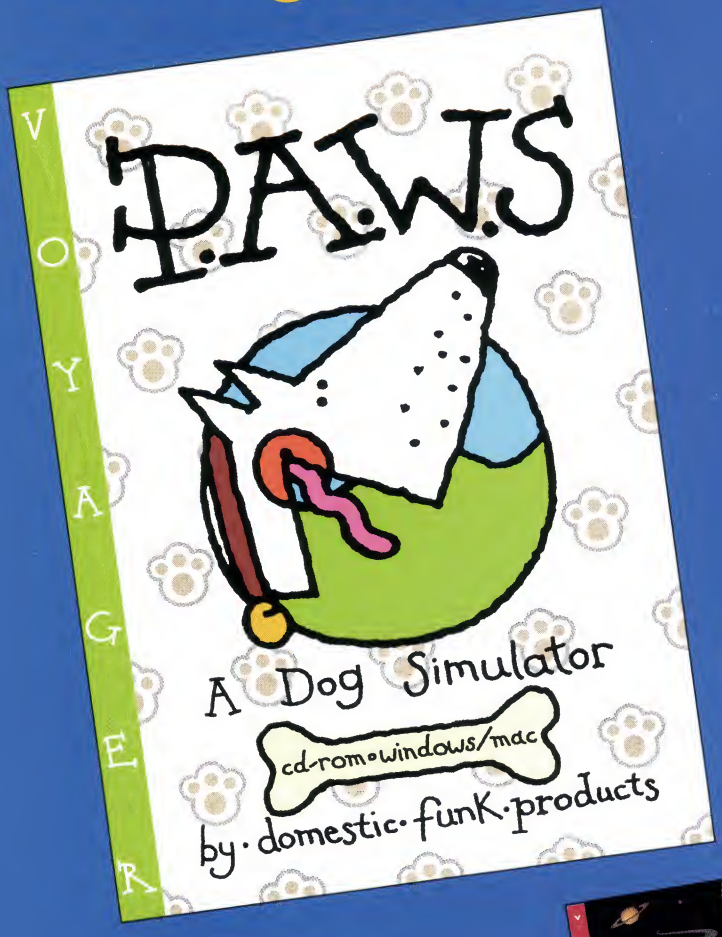
Why is he so adamantly antiwired? That's what Harvey Blume wanted to find out.

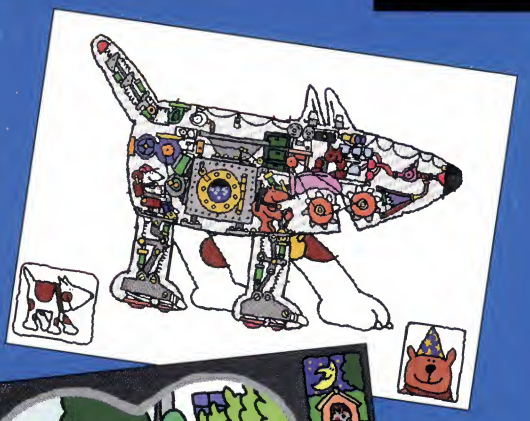
Harvey Blume is a writer and critic based in Cambridge, Massachusetts.

MICHAEL WARREN

If you're lucky, your kids will let you have a turn. Then again...

BRING YOUR BRAIN





See what dogs see. Do what dogs do.
Dig for bones. Chase cats. Scratch. Dream—in a world inspired by illustrator Alan Snow's prize-winning book, *How Dogs Really Work*. P.A.W.S is the Milia d'Or winner for the best children's title of 1995.

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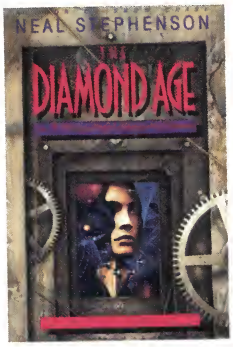
V O Y A G E R

Nanotech Writ Large

Readers engrossed in the first half of Neal Stephenson's novel, *The Diamond Age*, will search in vain for weaknesses. The characters are strong, the China Sea locales fresh, the writing rich and polished, the inventiveness unceasing. Stephenson vividly evokes a future that barely survives a nanotech revolution only to find itself on the verge of something even stranger. Stephenson's centerpiece is a brilliantly imagined interactive "Primer," stolen from its neo-Victorian creator and taken up by Nell, an illiterate girl in the slums of Shanghai. In the course of providing a customized education, the Primer maneuvers Nell into the forefront of the next revolution.



Fresh China Sea locales.

Unfortunately, as the novel shifts its focus from personal growth to social change, the narrative ascends to omniscient heights, losing contact with the main characters. It's like hiring on with Dickens and having Olaf Stapledon take the helm – a giddying journey, but ultimately disappointing. Stephenson can't be faulted for lack of audacity. If, by the end of *The Diamond Age*, he seems exhausted, it is no wonder: he gave himself an enormous task and nearly succeeded in all respects, instead of "merely" most of them. – *Marc Laidlaw*

The Diamond Age or, A Young Lady's Illustrated Primer, by Neal Stephenson, US$22.95. Bantam Books: +1 (212) 354 6500.

A Sure Cure for Phone Stress

Telephones make me crazy. I receive too many calls and I have too many numbers: office, home office, home, cellular, and pager, not to mention an equal number of PINs and access codes. Add to that an unpredictable schedule, and anyone trying to reach me goes crazy, too.

But now there is an antidote to this phone madness. It's Wildfire, a voice-recognition phone system that manages both incoming and outgoing calls. Wildfire captures the names of incoming callers and then calls me (it knows all my numbers and my schedule), tells me who is on the phone, and offers me the option of accepting the call or taking a message. If I opt for the latter, Wildfire apologizes to the caller and captures the phone number and message. If Wildfire can't reach me (I can set my schedule to "unavailable"), it will send a text message to my pager indicating the particulars of the call. Later, I simply tell Wildfire to give my callers a buzz – I don't need to hear their numbers, much less punch them in on the phone.

Wildfire may sound like a "receptionist in a box," but the comparison is misleading: in some instances, Wildfire completes tasks a human receptionist couldn't possibly accomplish. Reaching fellow Wildfire users is a case in point. In a typical example, I asked Wildfire to "call Bob," and it connected me with Bob, who also uses Wildfire, a moment later. Wildfire found him making a call from a pay phone at the San Diego airport, came onto the line, whispered to him that I was calling, and offered to put his first call on hold. After we talked, he went back to his other call.

Wildfire: More than a "receptionist in a box."

Wildfire also transforms the process of returning calls. Once I connect with Wildfire, I never have to hang up between calls, much less fuss with phone numbers. I used to routinely run a backlog of 30 to 50 unanswered messages. Since switching to Wildfire, my backlog has shrunk to an unstressful 4 to 5 messages.

But stress relief comes at a price. I'd be surprised if Wildfire isn't eventually made available through service bureaus catering to individual customers, but today the only option is an in-office system costing in the neighborhood of US$50,000, or slightly more than a conventional PBX/voicemail combo. McCaw (the Cellular One folks) just invested in Wildfire; let's hope they decide to bundle the service with the phones they sell as well. – *Paul Saffo*

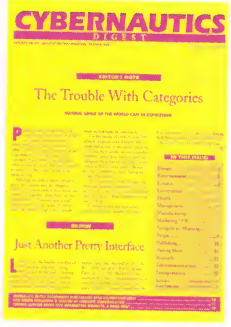
Wildfire: Systems beginning at US$50,000. Wildfire Communications Inc., Lexington, Massachusetts: +1 (617) 674 1590 or for a free demo call (800) 945 3347, e-mail: *info@wildfire.com*.

A View through the Forest

Technology reporting is the latest publishing trend – in case you hadn't noticed. Problem is, this barrage is much closer to hype-tech, and words like sludge quickly come to mind.

Think of *Cybernautics Digest* as *Cliff Notes* for tech media. This monthly newsletter provides an overview of the most important features on "critical trends and developments in information technology." Not a lot of fancy graphics, no ads – just Grade-A filtered information.

I've never been so well informed. Topics ranging from the telecom industry and privacy to interface



***Cliff Notes* for media.**

design are drawn from more than 245 source publications. I read *Cybernautics Digest* with pen in hand, circling companies and highlighting articles to track down later. (Source phone numbers are included.)

Also, I suggest its Web site at *http://www.pscu.com /cyber.html*. Only edited highlights are posted now, but once these guys start putting the entire newsletter online, complete with hypertext links to original articles, life will be ... well, nearly perfect. – *Jessie Scanlon*

Cybernautics Digest: US$2 per issue. KFH Publications Inc.: +1 (206) 547 4950. For a sample issue, send e-mail to *twhansen@cuix.pscu.com*.

Saturday Morning Trek

Remember the good ol' days when you could wake up at the crack of dawn dressed in your finest pair of Shazam Underoos, pour yourself a heaping bowl of multicolored crusty sugar cereal, plop your young bones in front of the boob tube, and engage in an American ritual known as Saturday Morning? From *Hong Kong Phooey* to *Land of the Lost* and all the *Bugs Bunny* in between, Saturday morning in the '70s was the true golden age of kiddie entertainment. Sadly, however, most of these fantastically campy shows have disappeared (can't even find 'em on The Cartoon Network). Except one: Filmation Associates and Paramount Pictures have released a laserdisc collection (23 episodes from the '70s cartoon treasure) called *The Animated Adventures of Gene Rodenberry's Star Trek*.

Plug in for nine hours of mindless TV ecstasy. Although Spock looks remarkably like Jughead from *The Archie Show*, *Star Trek* is strangely enjoyable, rife with authentic transporter noises, phaser bursts, and original cast member voices from the live-action program of the same name.

Never mind the animation, *Trek* toons are rife with original effects and plots.

Written by some of the same people who wrote for the original television series, plots of the animated series contain fairly sophisticated (at least compared to most cartoons) moments and a spooky *Star Trek* soundtrack full of oh-so-futuristic "space instruments" – definitely not standard Saturday morning fodder. For example, in "The Magicks of Megus-Tu" episode, the Enterprise ventures into the center of the universe – "the heart of creation" – and is captured by a Satan-like character named Lucien. And several "sequel" episodes to the live-action show feature well-known characters, such as Tribbles and Harry Mudd.

Hardcore Trekkers, cartoon enthusiasts, and pop culture vultures will all enjoy this collection (though perhaps for completely different reasons). The US$150 retail laserdisc price is steep, but aren't your memories worth it? – *Kevin Burke*

The Animated Adventures of Gene Rodenberry's Star Trek: US$149.95 for a six-laserdisc set. Pioneer Corporation: (800) 746 6337, +1 (310) 835 6177.

A Week at the Infodome

Infomercials are the vulgar vanguard of the cable TV explosion, low-tech to the extreme, and just barely getting the hang of interactivity. No one will admit to using them, but they manage to rake in more than a billion dollars a year in sales.

After a one-week trek through the infodome, here's a roundup of the most alarming of the bunch:

Growing in Love
Star quality: **The Giffords, Kathie Lee and Frank.**
What's being pitched: **Videotapes of "Hidden Keys to Loving Relationships" seminar by Gary Smalley.**
Most alarming scene: **Smalley, demonstrating how to "hold, hear, and give your heart" to someone, holds up an inflatable hand, ear, and heart.**
Best line: **Smalley, on sexual desire: "Men are like a microwave; women are like a Crock-Pot." (Huge applause.)**
Stretching the genre: **Talmudic discussion format, with Smalley as benevolent rabbi, surrounded by**

Gary Smalley advises how to hold onto your loved ones.

inquisitive, pastel-sweatered supplicants.
Want it anyway? **US$3.95 for the first tape, then $28.90 each monthly tape. (800) 848 8900.**

Passion, Profit, & Power
Star quality: **Host Marshall Sylver. He's a star. No, really – just ask him.**
What's being pitched: **Self-hypnosis videotape and audio cassettes to help tap human potential through "subconscious reprogramming."**
Most alarming scene: **Sylver snaps his fingers and the entire audience slumps over, one after the other, head to shoulder, in a deep hypnotic trance.**
Best line: **A believer confides she initially thought Sylver was a "phony" and a "fraud" until she got hooked; now she's "got a corporate America job!"**
Stretching the genre: **Creepy synergy of info-schlock with Pentecostalism (e.g. fire eating, glass walking); jaunty calypso music; shocking candor (Sylver: "If**

you're watching this infomercial, you're probably not where you want to be").

***Want it anyway?* US$99.80 for six audio cassettes, workbook, one-year subscription to monthly newsletter, video, and a weight loss or hypnosis training kit. (800) 634 7400.**

T-Touch
***Star quality:* Jane Fonda.**
***What's being pitched:* Tapes on techniques for taming unruly pets, known as the "T Touch."**
***Most alarming scene(s):* The entire program leaves you feeling you have witnessed an elaborate inside joke – on you. Animals shriek, bite, and jolt hysterically under high-end porno film lighting, as Cat Stevens-like melodies grind away.**
***Best line:* In a segment on "aloofness," a hysterical tabby bolts from its visibly peeved owner, who laments that her animal "refuses to be a LAP CAT!"**
***Stretching the genre:* It doesn't.**

Late-night tips on how to tame your tabby.

***Want it anyway?* US$45.90 for videotape and taming tip book. (800) 797 7387.**

Tony Little's Ab Isolator
***Star quality:* Tony Little. (See Marshall Sylver.)**
***What's being pitched:* Ab Isolator, which looks like a bungee cord, red and stretchy, for home exercise.**
***Most alarming scene(s):* Little punches and rubs his fists together accusingly and relentlessly, whenever anyone else talks. (He hates that.)**
***Best line(s):* Little's epic blond ponytail speaks volumes. It's matched pitch-for-pitch by his AK-47-fast sales schtick. Hold on tight during this one.**
***Stretching the genre:* If you like Monster Truck derbies, you'll love this one. Note Little's guests "abbing" away on stage during the spot – like Soul Train for white people.**

***Want it anyway?* US$35.90. (800) 636 9933.**
– Howard Savage

Design to Live by

I confess: I'm an unabashed Martha Stewart fan. I can't help it. I take style, particularly "lifestyle," very seriously. Recently, I had been feeling a bit self-indulgent as I daydreamed about milk-paint finishes and browsed flea markets for mid-century enamelware. Then I saw venerable British designer and retail wizard Sir Terrence Conran's *The Essential House Book*, and my guilt pangs disappeared. While Martha's world is a glamorous stage set, Conran's environments are carefully crafted to improve the lives of their inhabitants.

In Conran's words, *The Essential House Book* is "a serious attempt to explain to you how your house works in a fundamental way, much as a doctor might explain how your body functions and how its various systems interrelate." A heady goal, but believe me, Conran lives up to it. His philosophy of home design and its relationship to human behavior is so elementary and persuasive he could convince an auto mechanic to slipcover a suite of dining-room furniture. It doesn't hurt that this comprehensive volume contains no fewer than 650 luscious photographs of mouth-watering settings.

But before you sell your mother's life insurance policy to hire an architect (there's a list of 'em in the back of the book), heed Conran's Zen-like reminder that all any cook needs is "ingredients, heat, water, a sharp knife and a set of saucepans." In other words, don't copy a design just because it looks good. Think about the vagaries of your own life – your kitchen traffic patterns, for example – and build your living space around them.

Before attempting life transformation through design, heed Conran's Zen advice.

After a few dense chapters bearing elegantly simple titles like "Eating," "Relaxing," and "Sleeping" and a hefty directory full of expert information about everything from concrete to door handles, Conran gets down to the nitty-gritty with "Avoiding Trouble." There's much to avoid: dry rot, poor wiring, and an improperly lifted bag of cement all can rudely wake you from your Conran-inspired, life-transformation-through-interior-design fantasy world.

Still skeptical? People at work chuckle about my Martha obsession, but everyone who walked by my desk while *The Essential House Book* sat on it picked it up, browsed through it, and wistfully asked, "Can I borrow this?"

Martha, take note. It's a good thing. – *Steven Overman*

The Essential House Book, by Sir Terrence Conran: US$35. Crown Publishers: (800) 726 0600, +1 (310) 582 8800.

Playing in Outland

The sound of rolling dice bounced from my Mac's speaker. My modem's lights flashed and my invisible human opponent's backgammon pieces moved mysteriously around the beautifully textured board on screen – and landed on me. "Take that!" my opponent wrote in the chat window. I was in Outland, a network devoted Mac games: chess, Go, Backstab, Reversi, a cool group strategy game called Spaceward Ho!, and others. In this fantastic cyberstop, everyone has one purpose – to play.

True to Mac style, the interface is intuitive, and it sports good-looking graphics.

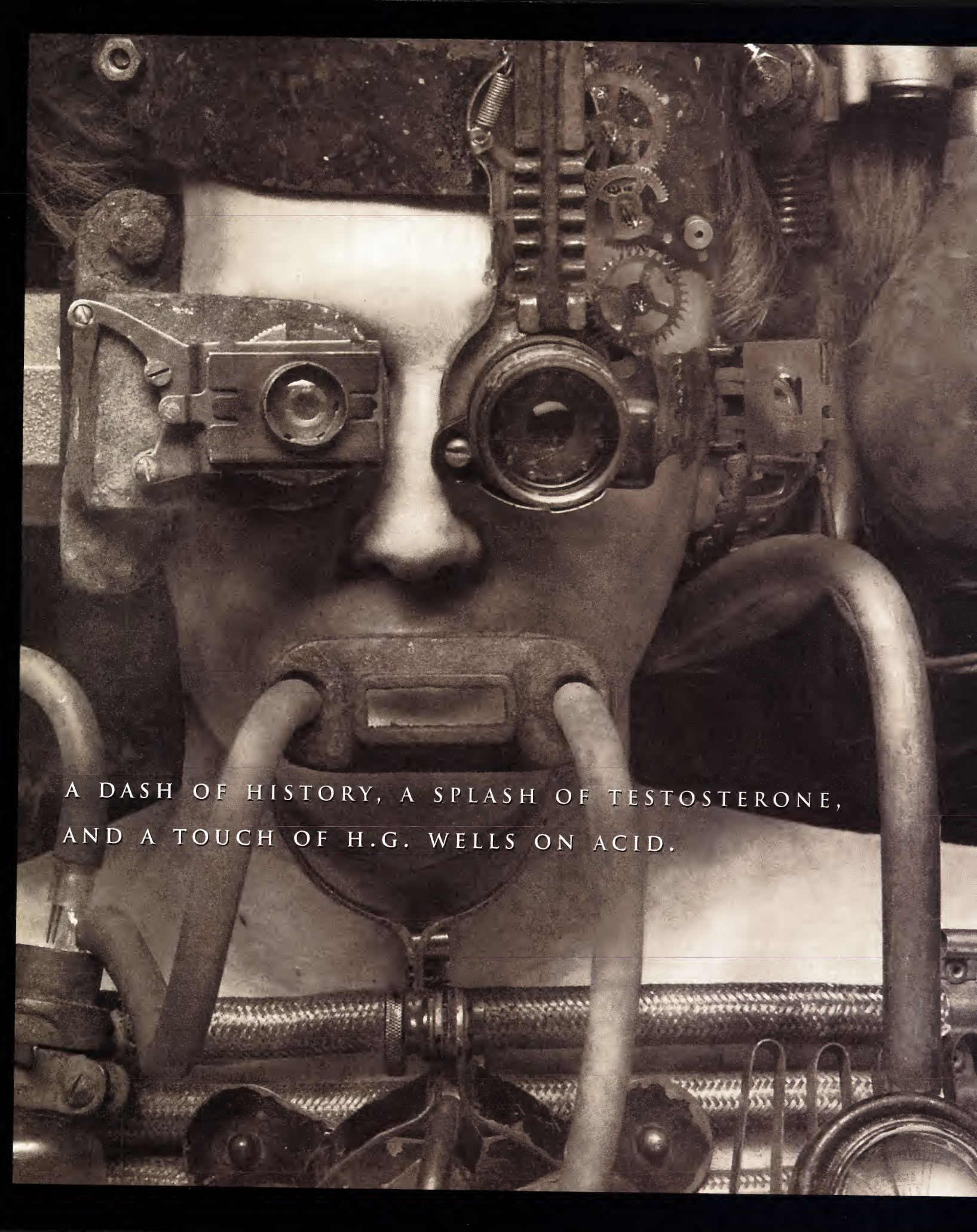
Cyberstop for gamers.

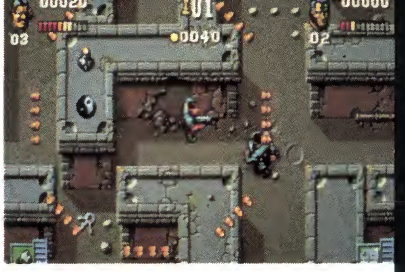
Most games have different skill levels, and no matter what you're playing, you can carry on live chats with your adversaries.

Without hourly charges, I found myself typing, "Hmm, got to think about this move" in the chat window and pacing around my room in my boxers glancing at the board on each lap.

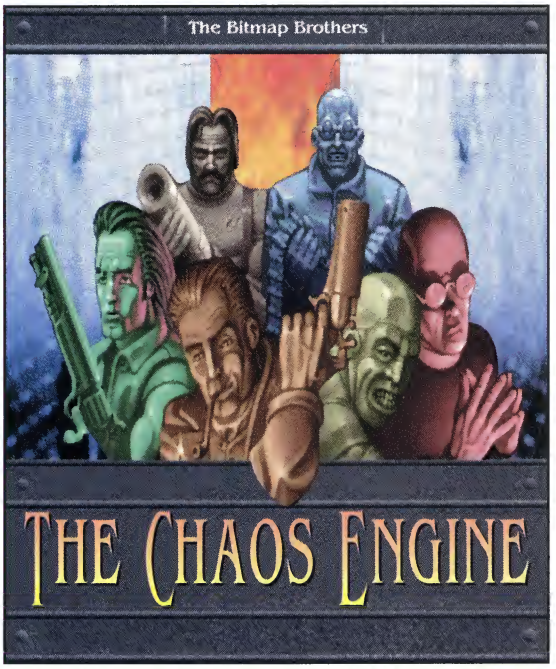
Finally, no more wandering around the house begging people to play with you.
– Caleb John Clark

Outland: US$9.95 a month. (800) 752 9688, via the Web *http://www.outland.com*, e-mail: *info@outland.com*.


A DASH OF HISTORY, A SPLASH OF TESTOSTERONE,
AND A TOUCH OF H.G. WELLS ON ACID.



Meet the Chaos Engine—a side of merry olde England you'd rather not know. But forget about tea and crumpets and all that jolly rotten stuff. 'Cause this arcade-action style CD-ROM game transforms your PC into a gruesome battlefield of psychotic monsters and ruthless warriors. We're talking armor-plated, razor-toothed killing machines here.



So pick one of six mercenary buddies, stock up on twenty-five deadly weapons and explore four fiendish worlds with 16 levels. But keep an eye peeled for mincemeat-making traps, life-saving power-ups and assorted keys. It's Britain's award-winning designers, the Bitmap Brothers, at their bloody best. God save the Queen? God save your ass.

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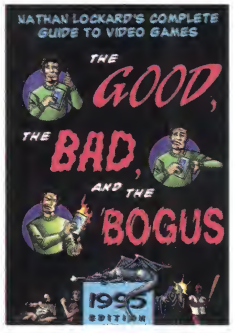
CHAOS ENGINE ©1995 THE BITMAP BROTHERS

Game Boy

I've done seven years of research for my book," says Nathan Lockard. "But I didn't know it was research until three years ago." That's when Lockard, now a high school junior in Redmond, Washington, started to get serious about videogames. The 16 year-old reviewed every game he could get his hands on (800 in all) and released them in his book *The Good, The Bad, and The Bogus.*

Lockard and his reviewers accept nothing but the most kick-butt action from games. Anything less receives critical commentary, such as, "The controls are the pits. Yuk!"

The Good, The Bad, and



Rated like a true teen.

The Bogus is not without its flaws. Despite the occasional nice 'n' nasty barb, the language is surprisingly tame and colorless. A thesaurus and a creative-writing course appear to be in order.

An online service with up-to-date game info would be an ideal counterpart to the book. While Lockard can't offer this – yet – gamers can stay plugged in with the subscription to his newsletter that comes with the book. *– Rogier van Bakel*

The Good, The Bad, and The Bogus: Nathan Lockard's Complete Guide to Video Games, US$14.95. Adventure Press: +1 (206) 343 7729.

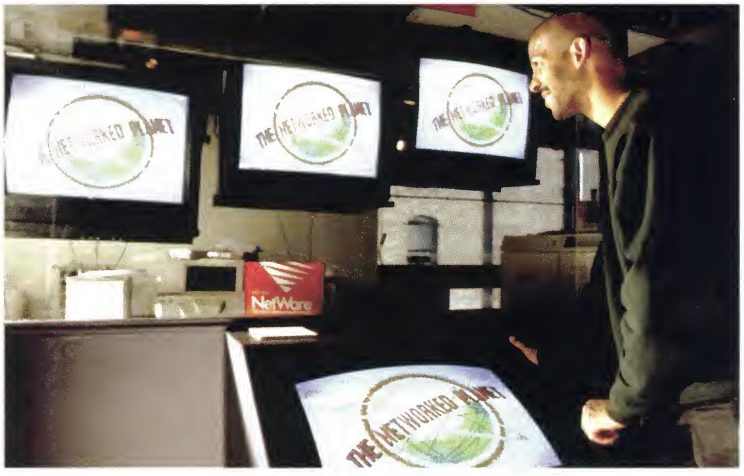
Around the World with Wires

Sure – America Online, CompuServe, and the Internet are computer networks – but don't forget, so are air-traffic control systems, cash machines, and supermarket checkout scanners. The Networked Planet, a permanent exhibit at The Computer Museum in Boston, introduces visitors to the panoply of computer networks and their social implications.

At the start of the exhibit, you receive a key card. After supplying the exhibit's computer network with information like your name, age, and zip code, you select one of four video "exhibit guides." At stations throughout the exhibit, you log in by swiping your card through a reader, and your guide greets you.

Each of the video guides presents a different perspective: Erica, a young mother who runs a small business from home, talks about the difficulties of balancing work and family. Beatrice, an older publishing executive, contrasts how things are done now with how they used to be done. Max, a social worker, raises issues of the technical haves and have-nots. Jessie, a teenage hacker, is supposed to be a voice of young people, but her performance falls a bit flat.

The exhibit shows how prevalent computer networks are in everyday



Networks allow us to fly to Europe, call friends, and spy on others.

life – even without a Net account. Pick up one of the pay phones on the museum wall when it rings, and you'll hear an explanation of how telephone networks and touch tones work. You can also access data from weather satellites. And a live air-traffic control area displays planes in flight over the United States. In the last exhibit area, museum visitors can surf the Net and poke around CompuServe.

The show designers effectively portray the risks as well as the benefits of network technologies. For example, a chilling video segment from CNN explains that companies can legally monitor their employees' every actions without informing them that they're being watched. To bring the point home, near the end of the exhibit, you can spy on other museum visitors using the network.

The exhibit, which opened late last year, still has some kinks. Some of the touch screens have impossibly small icons, and many things were broken – but of course not all of those are the museum's fault. When I was there, a 6-year-old boy managed to crash Mosaic twice in five minutes. Now that's a real education about the Net! – *Amy Bruckman*

The Networked Planet: US$7 adults, $5 kids. The Computer Museum: +1 (617) 426 2800.

Remedial Recognition

The plan was that my Newton Message Pad 110 would relieve me of those tiny scraps of paper cluttering my wallet and the ring of Post-It notes that had turned my monitor into a mutant flower. I diligently set out to transfer the minutiae of my life into the little black tablet, but soon discovered that while the Newton is great for storing and retrieving information, it sucks as an input device.

So my monitor continued to bloom, my desk and wallet remained cluttered with paper, and the Newton spent most of its time as an expensive bookend. Then a friend told me about Palm Computing's Graffiti, an application that provides an alternative to Newton or Zoomer's handwriting "recognition" software. He swore Graffiti gave him nearly 100 percent-accurate text recognition. Suppressing my skepticism, I bought a copy of Graffiti; within 20 minutes, my Newton was reborn.

Graffiti uses a modified, block-letter character set so each letter can be drawn in a single, unique

Time to dust off those Newtons and Zoomers!

stroke. Learning Graffiti is a lot easier than learning how to type. I was able to get decent results right out of the box.

Graffiti is friendly to those of us with sloppy handwriting: your characters don't have to be terribly legible or consistent. Its forgiving nature allows for a fair amount of speed – Palm Computing claims that a proficient Graffiti user can enter more than 30 words per minute. I'm not even halfway there, but I don't type that fast anyway.

Graffiti has the equivalent of shift, caps-lock, number-lock, and alternate keys that allow you to enter numbers, punctuation, extended characters, and diacritics. Try getting the Newton's recognition software to give you an umlaut, or even a semicolon.

Graffiti is the closest thing to a "killer app" for the Newton yet. Too bad it's a remedial solution, rather than a true enhancement. – *Eugene Mosier*

Graffiti: US$79. Palm Computing Inc.: (800) 881 7256, +1 (408) 848 5604.

THE NETWORKED PLANET: © MIKE MALYSZKO 1994 ALL RIGHTS RESERVED

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The Arditti Quartet

1974 – 1994 Arditti Quartet
From Vienna
Montaigne/Auvidis Records
Access Code 1271

Since the time of Joseph Haydn, the string quartet has been arguably the most significant form of chamber music. Nearly every significant composer of instrumental music through the early part of the 20th century composed at least one string quartet, and the medium seems to have inspired many – including Mozart, Beethoven, and Bartók – to produce some of their their greatest accomplishments.

After World War II, interest in composing for the genre declined. Enter the Arditti Quartet, founded in 1974 and dedicated to the cause of performing and commissioning new music. Working closely with composers, the group is responsible for the existence of dozens of new pieces in a wide variety of

styles, while it also performs works from the early part of the 20th century.

Two new releases celebrate Arditti's 20th anniversary. *1974–1994 Arditti Quartet* samples the group's more than 20 recordings, including works by Schoenberg, Webern, Nono, Xenakis, and Elliott Carter.

***From Vienna* presents 30 new pieces by 30 different composers, written specifically for the Arditti Quartet and dedicated to music publisher Alfred Schlee on the occasion of his 90th birthday in 1991. Included are compositions by such notables as Olivier Messiaen, Pierre Boulez, Luciano Berio, György Ligeti, Alfred Schnittke, and Arvo Pärt, but the disc offers a chance to hear the work of many lesser-known composers as well.**

All pieces on *From Vienna* are short vignettes (only one track is over four minutes in length – most are under three) – a distinct advantage for the amateur approaching this unconventional, intricate, and emotionally intense music for the first time. Here, on a single disc, is an opportunity to mine for the very latest music in wonderful performances. There are many gems to be found. – *Bryan Higgins*

Anthony Braxton

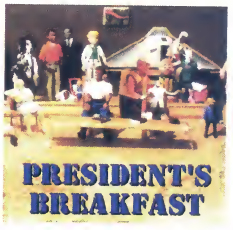
Twelve Compositions
Music & Arts
Access Code 1272

Composer and woodwind master Braxton offers large-scale jazz compositions that encourage daring flights of imaginative improvisation. This two-hour sampling from live concerts proves that distinctively different musical personalities can forge a common ground when interpreting Braxton's work. Blending the unrelenting intensity of black gospel with the structural openness of John Cage, Braxton and friends offer freewheeling, enthusiastic performances that redraw the boundaries of jazz.
– *Norm Weinstein*

President's Breakfast

Doo Process
Disc Lexia
Access Code 1273

Good morning! Our special today is President's Breakfast, a 15-member collective gathered from San Francisco's freshest improvisational and hip-hop acts. Mixing Tackhead with *Aja*-era Steely Dan, *Doo Process* features prime slabs of buttery funk heaped with piping-hot jazz, garnished with rap and reggae. Try the spicy "Yaah!," or the more palatable opener, "Gank Dub." President's Breakfast reminds you of Clinton, all right ... *George* Clinton. Grab yourself a plate.
– *Colin Berry*



Glenn Branca

Symphony Nos. 8 and 10 (The Mysteries)
Atavistic CD

Glenn Branca may be America's finest living neo-classical rocker. Or is that neo-rockical composer? This CD doesn't offer a clue about that question; in fact, the music belted out by Branca's eight-guitar mini orchestra (plus bass, keys, and drums) raises more riddles than it answers. It crushes its way through *The Mysteries*'s classical/romantic framework using unrelenting *Rawk!* bombast, like a bevy of Sonicmelvinyouth exploring music of slow changes. A mess of a pleasure to behold.
– *Patrick Barber*

Jimmy Johnson

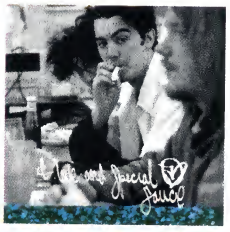
I'm a Jockey
Verve
Access Code 1274

The blues lyrics of guitarist and vocalist Jimmy Johnson intimate a life out of control, but the compositions are a tightly arranged affair. Johnson emerges from a nine-year recording hiatus with a smoldering set covering a gamut of grooves in well-orchestrated fashion. Upbeat shuffles alternate with driving funk; an appealing ballad develops over a quasi-reggae bass line. All the while, a crackling horn section adds polish and panache, prodding the soloists to pour their hearts into a genre that would have it no other way. – *James Rozzi*

PJ Harvey

To Bring You My Love
Island Records
Access Code 1275

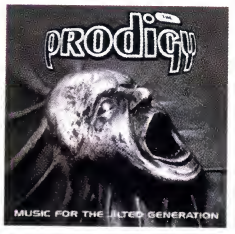
PJ Harvey's been mingling with old bluesmen. With that spur of melodic, lyrical repetition beneath her signature arrangements (layers of complexity and gaping vocals), she unfurls her fourth release. From the onslaught of the funereally confessional "To Bring You My Love" to the swallowing piety of "Teclo," this imperious record thrives, despite a slightly festering, murky mix. From the dark morass of percussion and chilling vocals emerges a quiet and irreverent confidence, one shining with a compelling blend of intricacy and innovation.
– *Allison Diamond*



G. Love & Special Sauce

G. Love & Special Sauce
Epic
Access Code 1276

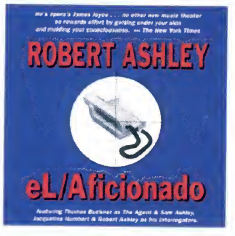
Boston's hippest white boys, G. Love & Special Sauce, deliver an infectious début of eclectic rock-and-blues ruminations 'bout hoops, drinks, and love – without sounding derivative or wannaBeastie-ish. It's all glued by "Blues Music," a slow, hypnotic "Walk on the Wild Side"-inspired homage to those who paved the blue path, from Blind Lemon to Woody Guthrie to Chaka Khan. In an age of "Budweiser Presents," G. Love & Special Sauce offer moonshine on the front porch. This is down-home sauce for the soul. – *Larry Smith*



The Prodigy

Music for a Jilted Generation
Mute Records
Access Code 1277

Who'd have thought The Prodigy capable of this inspired and damn-near perfect long player? With jungle giving dance music a hard kick in the ass, The Prodigy is perfectly positioned to baptize the masses with the current sound of London. Tracks such as "Voodoo People" and "Poison" are sci-fi-infused techno monsters. The music of The Prodigy is as "serious" as anything by the ambient élite – and it's a helluva lot more fun: melodic enough for Top-40, manic enough for beat addicts, hard enough for underground purists. – *Scott Taves*



Robert Ashley

eL/Aficionado
Lovely Music
Access Code 1278

While Philip Glass may have ushered in the era of new opera and John Adams appears to have taken center stage, Robert Ashley is creating the real masterpieces. Enigmatic, cryptic, wonderfully mysterious, *eL/Aficionado* has a story line and narrative structure, as do Ashley's previous operas. Though the characters hail from Middle America, they are set in a parallel universe, familiar and alien. The music is austere, simple, even minimalistic, yet utterly compelling. *The New York Times* was dead-on in proclaiming Ashley "opera's James Joyce."
– *Dean Suzuki*

Microwave O' The Month

MICROWAVED CD: LISA SEAMAN

Godflesh

Selfless

Earache

If this was a weathered Motley Crue vinyl 45 skipping on the turntable, it might have been kinda cool. I wanted to believe this droning, testosterone-laden chunk-spew of noise was a joke, but I think these guys are serious. Oops. – *Steven Overman*

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At the beginning of each music review, you'll find a four-digit code for each album. To hear sample cuts, dial the 900-number above, entering this code when prompted. You'll hear up to three minutes of music, at 95 cents per minute. To fast forward, punch 3; for louder volume, 4; softer, 5. To use Music Access, you have to be 18, have a touch-tone phone, and dial from the US.

Code	Artist and Title
1271	The Arditti Quartet, *1974–1994 Arditti Quartet, From Vienna*
1272	Anthony Braxton, *Twelve Compositions*
1273	President's Breakfast, *Doo Process*
1274	Jimmy Johnson, *I'm a Jockey*
1275	PJ Harvey, *To Bring You My Love*
1276	G. Love & Special Sauce, *G. Love & Special Sauce*
1277	The Prodigy, *Music for a Jilted Generation*
1278	Robert Ashley, *eL/Aficionado*

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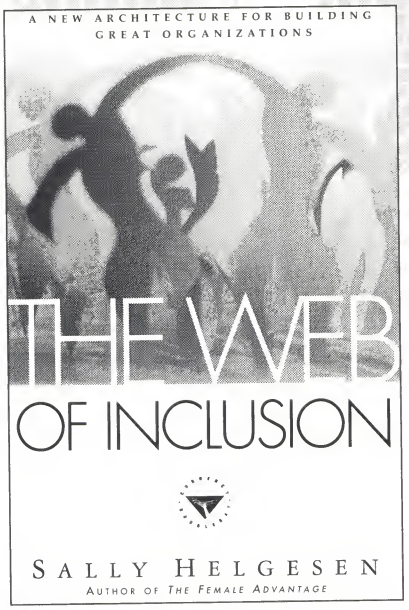

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Hack the Mac

FutureBASIC is a ticket inside Macintosh programming, with a far more modest headbanging quotient than other languages like Pascal, C, or C++. I might say it's designed for folks who don't have the time, inclination, or energy to learn a higher-level language, but that does FutureBASIC a disservice – its simple syntax, lovely editor, good debugger, and well-designed project interface make it a joy for programmers at any level.

Besides, it's cheap: US$49.95 for the program diskette, along with unusually clear and well-written documentation. For an additional $20, you get source code for four games, a diskette of the best of *Inside Basic* magazine, and a book called *Programming the Macintosh Using FutureBASIC*.

A ticket inside the Mac.

The highlight of the package is a game called *Ball Catcher*. It's not *Doom*, but by walking through the code, you'll learn about event traps, menus, creating resource files, and how to perform simple animations.

Whether you're writing commercial code or you just want to hack the Mac, FutureBASIC is a great product. – *Daniel Marcus*

FutureBASIC: US$49.95. Zedcor Inc.: (800) 482 4567, +1 (602) 881 8101.

Virtual Piglet Lab

The Fetal Pig – here's a great, not to mention gutsy, name for a software title! This program is billed as a "comprehensive introduction to the anatomy of mammals which can complement or replace fetal-pig dissection units." In other words – it's virtual dissection for the squeamish, not to mention the ultimate politically correct educational software.

This Mac-only, single-disk application lets students explore the anatomy and biological functions of a fetal pig without hacking up a real dead, stinky, formaldehyde-soaked piglet. I remember my high school biology lab (ugh, right after lunch) with their stench and rubbery piglet skin as if it were yesterday. All the major systems are covered, including respiratory, reproductive, digestive, skeletal, and nervous. Kids can explore diagrams of the major systems on their own, play hangman-ish word games, or take tests.

The disk's HyperCard-like stack features simple, low-resolution, black-and-white interactive diagrams of a dissected piglet with detailed blow-ups and a few sounds. The diagrams are simple because the software fits on a single floppy, but they provide a lot of information and are usable on almost any Mac (LC or higher, 1Mbyte of RAM) – crucial for schools. *The Fetal Pig* comes with a hard copy teacher's guide that follows the 10 lessons on the disk.

***The Fetal Pig:* Dissect an oinker free of remorse and formaldehyde.**

The software has been sold to nearly 1,000 schools, and a company that sells real pigs offers the software as an alternative/supplement to customers. Fetal pigs around the world are breathing a sigh of relief, and whole generations of kids may soon escape the stink of formaldehyde.

Other dissection software available from Ventura Educational systems are *VisiFrog* and *The Earthworm*. Lab packs and network versions are available. – *Caleb John Clark*

The Fetal Pig, for Mac: US$59.95. Ventura Educational Systems: (800) 336 1022, +1 (805) 473 7383.

Wireless Wizardry

The biggest drag about setting up sound for home theater or a party is running the speaker wires through the house. I always avoided the ordeal, until I tried JBL's SoundEffects, a mix-and-match set of wireless speaker systems.

Among its many options is the Magic 2 transmitter and tuner system – with stand and a 20-watt channel amp designed to broadcast two channels of sound over a 900-MHz radio link at distances of up to 120 feet. Mount two JBL Sat 2 satellite speakers on the stand, adjust the angle (back to back for surround sound, angled for stereo), and you can pick up the whole kit by the stand's handle and move it anywhere there's AC to power it – no signal wires attached.

I set up the system in the back of my bedroom and watched videos, immersed in surround sound. Outside, it works well up to about 60 feet before reception starts fading. The system's not loud enough to cover large outdoor spaces, but my neighbors don't mind this, and I can always run additional speakers from the same transmitter to cover more areas.

Immerse yourself in sound – no signal wires attached.

The sound is pleasant, smooth, and natural – a perfect match for many of the small speakers I already own. With the Sat 2 speakers, the bass goes down to about 50 Hz. If you want an even greater range, an optional subwoofer can extend the frequency to just below 30 Hz.

There are other 900-MHz systems out there, but I'm sold on the JBL. It's the first and the best-sounding model. JBL's Take 2 (the same setup as Magic 2 but without the stand and amplifier) is also the only system you can use with the amps and speakers you already own. Now, if only I could get rid of all *my* television, telephone, and cable wires just as easily. – *Ivan Berger*

Magic 2: US$649 for tuner, amplifier, transmitter, and stand. Sat 2: $399 speaker pair. Take 2 transmitter and tuner: US$499. JBL: 80 Crossways Park West, Woodbury, NY 11797: (800) 336 4525, +1 (516) 496 3400.

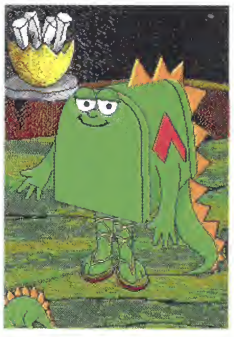
WIRELESS BACKGROUND: MATERIAL WORLD CD© STUDIO-BC

E-Mail Patrol

Give kids an inch of access and the next minute they're cruising the Net, disguised as lonesome supermodels or downloading an alt.autoerotic.asphyxiation.here's.how FAQ. KidMail is designed to head this off by letting kids e-mail from a parent-patrolled world of cheerful graphics.

KidMail lets you send e-mail from online services, but only to and from addresses approved by a supervisor, who can also limit messages.

Kids select Prehistoric, Space Age, or Secret Agent windows to read or send mail. Those uncertain of their powers of composition can use Quick Messages. Click on one, and KidMail fires off canned greetings and thank yous. Twisted adults may enjoy these. As I e-mailed a friend, "Our country was born on the Fourth of July/And that's why those fireworks light up the sky/Hope your 4th is Safe and Sane!"



Clamp down on kid mail.

The prehistoric world conflates Mesozoic and Cenozoic – dinosaurs coexist with Bedrock-style abodes. But no one promised KidMail would teach science.

KidMail seems aimed at grade schoolers, so older kids may feel trapped in a chirpy e-mail jail. But if you worry about kids e-mailing Singapore officials to come clean up your town, or incurring huge online bills, KidMail may be what you're looking for. – *Susan McCarthy*

KidMail Connection for PC: US$35 for diskettes, $30 for CD-ROM. ConnectSoft: (800) 889 3499, +1 (206) 827 6467.

Kickin' Some Gigabutt!

You can almost hear the TV execs talking on this one. "OK, OK – we'll take the cuteness quotient of *Blossom*, right, throw in the interpersonal dynamics from *Saved by the Bell*, OK, OK, still with me? OK, last part now, this is where the twist comes in, mix these two together, add a pinch of *Mighty Morphin Power Rangers*, and I'm telling you, we'll have a bona fide hit, it'll be huge, we'll call it, hmm, we'll call it the *Superhuman Samurai Syber Squad*."

Featuring the same campy antics as the mighty *Power Rangers* but with a decidedly more techno twist, *Superhuman Samurai* airs weekday afternoons on independent US television stations. Flouting any kind of conventional logic, fuzzy or otherwise, a group of teens, led by superhero Servo, battles Kilokahn (voice of Tim Curry), the Evil Overload Overlord of the Digital World, as he attempts to take over the grid – the buzz term for all things Internet and communications-oriented.

In cahoots with Kilokahn, frustrated teen hacker Malcolm Frink creates Megavirus Monsters, which are sent via phone lines into the grid. By striking a guitar and saying loudly, "Samurize guys!" good guy and definite milk drinker Sam Collins (played by Matthew Lawrence, brother of teen heartthrob Joey) transforms into the supercharged hero Servo to combat the Megavirus Monsters. When Servo gets in trouble, he calls on his teen friends, who have their own snappy catch phrases like "Pump up the power!" and "Let's kick some gigabutt!"

***Superhuman Samurai Syber Squad:* Think *Power Rangers* with Net accounts.**

Featuring a comical live-action stage set that looks like the inside of a telecommunication switch box, *Superhuman Samurai* peppers its often goofy dialogue with references to the Net and other computer lingo like "interface" and "digitally rendered" that suggest the 10-year-old viewer might be a little more techno fluent than previously thought. All this *and* the most blatant product placement in the annals of computerdom – all sequences set in the digital world are neatly framed with the word COMPAQ written in the lower left corner of the monitor screen.

Now, if only superhero Servo could do something about those nasty real-life Telecom Overlords. – *Todd Kreiger*

The Superhuman Samurai Syber Squad: Check local listings for televised times in your area. Produced by DIC Entertainment and distributed by All American Television.

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national security vs. right to privacy

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1. High-Tech Outrage
What makes Net users so vociferous about obscure technical issues? Everything from the Pentium chip to the GIF copyright to the urban legend about an FCC-imposed "modem tax" has prompted massive net.outcries. The Net itself is part of the problem. Because replies can take days to appear, one message can incite hundreds of others before flames can be cooled with the facts. But the more fundamental problem is that experienced Net users are beginning to feel like a beleaguered élite: under attack by commercial forces and a growing popularity, they feel the need to make their independence known.

2. Smart Homes
Technologists have been predicting smart homes, capable of making breakfast when we wake and turning down the heat when we sleep, since the 1940s. Unfortunately, the first prototypes of the late '70s, when microelectronics became cheap and pervasive, were so primitive and difficult to use that they indelibly taint the phrase "smart home." Nonetheless, as technology continues to invade the home, a battle for the home-automation market is brewing. Three competing organizations are proposing communications protocols for home appliances. Whether the appliances have anything to say to each other, however, remains unclear.

	Current Position	Position Last Month	Months on List
High-Tech Outrage	1	1	2
Smart Homes	2	–	1
Voice Recognition	3	–	1
The Return of Mainframes	4	–	1
HDTV	5	–	1

HYPE LIST

3. Voice Recognition
According to many computer-industry experts, 1995 is the year of voice recognition. New processors can finally provide the horsepower for this task. The question now is whether software designers can find compelling uses for the technology. Most systems simply use voice recognition to trigger menu commands. So unless you normally have your hands full, it's not much of a win – it just annoys your neighbors. Besides, being able to recognize voice just makes a computer's inability to understand speech that much more obvious.

4. The Return of Mainframes
Mainframes fell out of fashion for the same reasons that cars from Detroit did. The monoliths came to be seen as old-fashioned and clunky. Experts claimed "client/server" solutions would cost less, adapt quickly to changing needs, and speed software development. Yet these systems were plagued with unreliability, breakdowns, and other problems. A steadily building chorus of voices is arguing that maybe mainframes aren't all bad. It's a sound that is buoying IBM's spirits and bottom line.

5. HDTV
The US broadcasting industry is beginning to panic now that HDTV has failed to catch on in both Japan and Europe. Worried that prettier pictures won't sell HDTV, it is being touted as a digital transport system, a flexible wireless communication service for everything from e-mail to stock quotes. The discussion is incredibly premature, considering the unresolved technical issues, not to mention regulatory roadblocks. It also assumes – probably wrongly – that there are more people interested in wireless online service than in watching *Star Trek* in high resolution.

***– Steve G. Steinberg* (hype-list@wired.com)**

Boomer Races

If you remember Penelope Pitstop, Professor Pat Pending, and the evil Dick Dastardly, you'll love the nostalgic rush the *Wacky Races* CD-ROM will trigger. It's been decades since I've heard Penelope's girlish southern drawl and Muttley's wheezing snicker from the popular Hanna-Barbera cartoon. The animation here is far better than on most CD-ROMs, with fluid movement, brilliant colors, and fantastic details. For the first 10 minutes, I was rapt with a childlike charge.

Unfortunately, after the initial burst of excitement and nostalgia wore off, I realized the visuals were more interesting than the game. The object is to travel through a whimsical yet dangerous

Steer clear of evil Dick.

land to capture the evil Dick Dastardly before he conquers the world. Problem is, *Wacky Races* didn't allow me to explore areas on my own or make many real choices. Instead, the animated world went along, and every once in a while, I brainlessly clicked on a button or character to continue the action.

Despite this failing, *Wacky Races*'s humorous characters, resplendent images, and amusing stories will likely delight young children. It's also a must for those Boomers who want a blast from the past. – *Carla Sinclair*

Wacky Races: US$49.95. Future Pirates Inc: +1 (310) 396 6788.

Poetry in Motion

Many film historians insist that Buster Keaton, the sad-faced genius of silent comedies whose stoic demeanor earned him the nickname "The Great Stoneface," was the funniest man ever captured on celluloid. Kino International provides more than ample evidence to support this claim with *The Art of Buster Keaton*, a staggering three-box set of 11 features and 19 two-reelers from Keaton's heyday in the '20s.

For those who have never seen Keaton in action, these videos will be a revelation. For its showcase of sheer physical inventiveness, Keaton's work is peerless: from the disastrous do-it-yourself home construction exercise in *One Week* to the hundreds of policemen on their staggering chase in *Cops* and the surreal flight in *The Balloonatic*, Keaton filled the screen with sight gags and situations that have never been equaled.

But don't think of these films as endless slapstick. The subtle nature of comic dilemmas in features like *Our Hospitality* and *The General* show the heart and

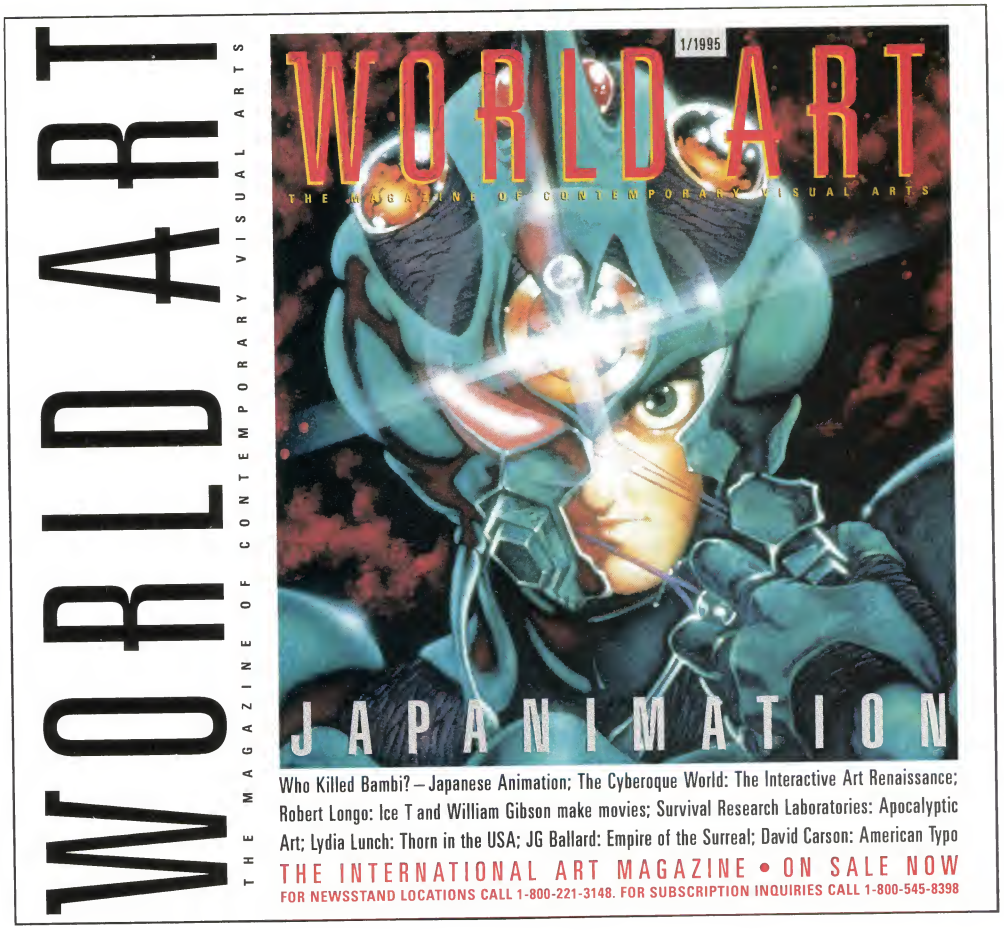
Keaton's dynamic sight gags fire up the screen.

soul of the clown with a beauty that isn't in the least maudlin or icky.

Keaton fans will no doubt relish this comprehensive collection of his finest work, especially the long-lost *Hard Luck*, which was his own favorite short. And though many of these titles have been available in various forms from public-domain houses, the Kino collection's new digital transfers and original music scores make these audio/visual treats more accessible than ever.

For those either new to or perhaps already familiar with The Great Stoneface, it is impossible not to convulse with laughter when viewing him in action. Turn on the answering machine, make a ton of popcorn, and be sure you've written your will – there's a good chance you'll die laughing. – *Phil Hall*

The Art of Buster Keaton: three-box set US$79.95-$109.95, individually $29.95. Kino International Corporation: (800) 562 3330, +1 (212) 629 6880, fax +1 (212) 714 0871, e-mail *lanserik@aol.com*.



A Tankful of Kanji

Sooner or later, anyone learning Japanese must wrestle with its awe-inspiring written characters. Kanji is easily one of the most complex writing systems on the planet. To read even the simplest Japanese newspaper, you need to know thousands of characters.

You can carry around a big stack of dictionaries, or better, get a Canon Wordtank, which packs plenty of kanji into a wonder toy the size of a supermarket romance novel. Wordtank holds more than 6,350 incredibly subtle ideographs, 35,875 compounds, 650,000 dictionary entries,

Kanji crammer.

and 9,800 sample sentences.

At first, the Japanese interface might scare you off; fortunately there's an English mode for beginners like me. The quiz function is great for both learning new words and memorizing kanji. I take Wordtank everywhere – I even whip it out on the subway.

Reports on *sci.lang.japan* say Wordtank can be had for up to US$100 less in the streets of Japan – if you use the right words. – *David Voss*

Canon Wordtank Super IDX-9500: US$449. US distributor: GITCO (800) 527 2607, +1 (510) 704 9129.

Love on the ROM

As a roving urban chickie, I am abundantly qualified to take *CD-ROMANCE*, a quarterly CD-ROM singles magazine, for a spin. With more than 300 video-enhanced personals from men and women in the US to choose from, I figured my pursuit of a playmate was sure to be a fun and successful endeavor.

After a less-than-one-frame-per-second video introduction, I filled out the rudimentary questionnaire, describing whom I was seeking: age 21 to 39; height 6 feet or taller; religious and ethnic options – blank; search words "ski" and "sail." Then I gleefully awaited my potential mates. There *were* none. I was an unmatchable woman (proving my last boyfriend right on that score!). Nixing the search words, I was promptly matched with five men. Hmm. Apparently, common interests hold little sway with this electronic matchmaker.

No matter: five eligible bachelors were lined up to meet me – all a quick e-mail or voicemail away! First there was Adam, an interesting creature, who provided a photo montage, audio track, *and* video clip of himself. A biomedical engineering student/guitarist big on Spyro Gyra

Adam, an engineering student, says people are surprised to learn he plays guitar.

and classic rock, we had nothing in common but being human and Jewish. Plus, he's in Chicago, making lunch dates a stretch.

Next is Bob. Bob's fave food is milkshakes. Bob is also into classic rock, and his favorite entertainer is Cindy Crawford. Nuff said. I browsed on and came across Bryan, who blades and likes U2 and *Green Eggs and Ham*. We were getting warmer, except that he lives in Cincinnati.

Frank, another classic-rock aficionado (apparently the keyword "classic rock" would garner more fans than Toto!), was seeking a woman who lived in Georgia.

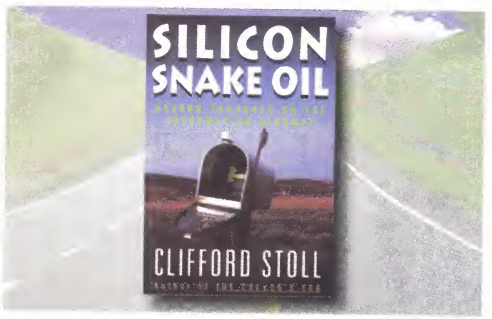
This was silly. What's the attraction of tinny audios and jerky videos of men located all across America? But, trooper that I am, I clicked on man number five, Matthew. A Vegas-based lawyer, he digs R.E.M. and *Melrose Place*. Right on! In his personal comments, he said the CD-ROM seemed an easier way to meet women "than trying out for *Studs*." Unfortunately, I'd have to disagree. – *Jennifer Cowan*

CD-ROMANCE: The Multimedia Meeting Place, for Mac or PC: US$49.95. Romulus: (800) 266 4557, or on the Web: *http://www.iquest.net/cdromance/personals*. There, $5 will get you five matches.

net.backlash

In his best-selling book *Cuckoo's Egg*, astronomer and part-time computer scientist Clifford Stoll told of his pursuit and capture of a gang of German hackers. Now, he's back with a 230-page meditation on life in cyberspace. And his report is bleak.

***Silicon Snake Oil* is a loose collection of anecdotes and bon mots that illustrate his twin themes: too often we mistake information for knowledge, and cyberspace is no substitute for real-world sensation. Stoll argues that the speed of online discussion fosters flames rather than reasoned debate, that mastering the constantly changing skills required to use computers is time poorly spent, that the fancy text and graphics possible with computer publishing leads to a false and dangerous sense of professionalism, that our lives would probably be better if we tossed some of the newfangled contraptions.**



For a clear conscience, take these bon mots a page at a time.

Stoll says nothing that cultural critics such as Sven Birkerts and Neil Postman haven't said many times before, and more eloquently. But because Stoll really knows computers, from the frustration of Unix manuals to the intricacies of TCP/IP, his criticisms can get under your skin.

You want to tell him: "Yeah, but next year's version...." and "Sure, but with all the time I save...." But after Stoll's fiftieth example of how computers force us to master technical minutiae at the expense of real learning, those replies seem less credible. This book is too relentlessly one-sided and too rambling to be read straight through, or to be entirely convincing. But when your eyes get blurry from staring at a computer screen, pick up this book and read a page at random. Then go outside with a clear conscience. – *Steve G. Steinberg*

Silicon Snake Oil: Second Thoughts on the Information Highway by Clifford Stoll: US$22. Doubleday: +1 (212) 354 6500.

SILICON SNAKE OIL BKGD. MEDIA RIGHTS: AMERICA CD-ROM WORDTANK PHOTO: WILLIAM FAULKNER

Street Cred Contributors

Patrick Barber wonders how it would sound if all the cars stopped. He is a writer.

Ivan Berger, technical editor of *Audio Magazine*, has been writing about audio and other aspects of electronics since 1962. As an Altair owner in 1976, he was one of the first with a home computer.

Colin Berry *(cpberry@aol.com)* clutters the pages of *Option, Ray Gun, SF Weekly*, and the upcoming *The Happy Mutant Handbook*.

Amy Bruckman *(asb@purple-crayon.media.mit.edu)* is a graduate student at the Media Lab at MIT, where she does research on virtual communities and education.

Kevin Burke is a former editor at *Film Threat Magazine*. He is working on a pop-culture history and criticism book for St. Martin's Press due out in November 1995.

Caleb John Clark *(calebjc@aol.com)* is a San Francisco writer who lives in the heart of North Beach. He feels like he's been hit in the forehead with a slingshot-fired won ton.

Jennifer Cowan is no longer using technology to find a mate: she has started cruising laundermats and gun clubs. She just finished making a film on Douglas Coupland.

Allison Diamond *(allison@well.com)* is a columnist for *The American Music Press* and contributes to *Bikini, Detour*, and *Plazm*. She likes to bite.

Bryan Higgins *(bryan@well.com)* plays the French horn and clavichord, writes fiction and software, and lives in Berkeley and Soda Springs, California.

Todd Krieger *(tkrieg@eworld.com)* is a reluctant nomad in search of the perfect chili dog.

Marc Laidlaw is the author of *Dad's Nuke, Neon Lotus, Kalifornia, The Orchid Eater*, and the forthcoming *The 37th Mandala*.

Daniel Marcus is an applied mathematician and fiction writer. His short stories have been published in *Asimov's Science Fiction, Fantasy and Science Fiction*, and *Science Fiction Age*.

Susan McCarthy is a carbon-based life form and a native of Earth. "I enjoy being a biped," she reports.

James Rozzi *(rozzij@mail.firn.edu)* is a freelance writer, woodwind musician, and teacher in the Orlando, Florida, area.

Paul Saffo *(psaffo@iftf.org)* is a research fellow at the Institute for the Future in Menlo Park, California.

Howard Savage is a television producer.

Carla Sinclair *(carla@well.com)* is editor in chief of *bOING bOING* and co-editor of *The Happy Mutant Handbook*, to be released by Putnam-Berkeley in 1995.

Larry Smith *(larrys@igc.apc.org)* is a freelance writer and editor of *MediaFile*, the San Francisco Bay Area media review printed on an attractive medium-grade recycled paper.

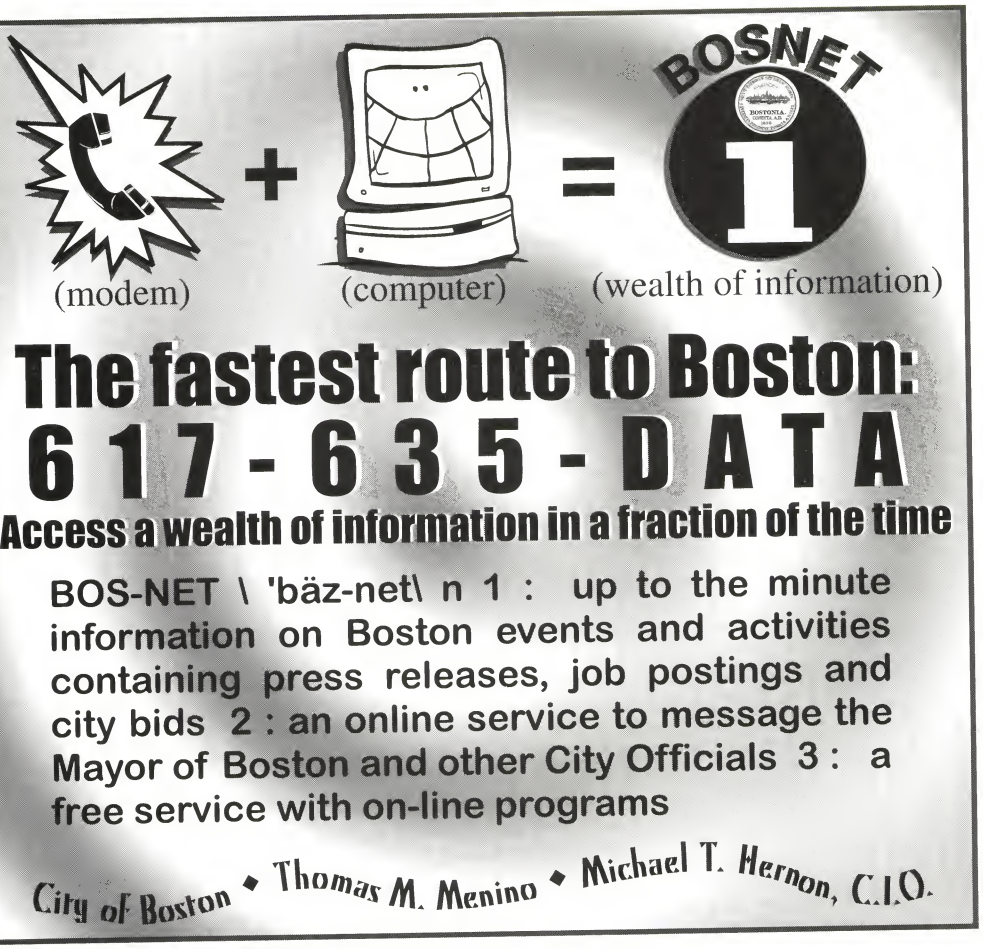
Dean Suzuki teaches music history with an emphasis on 20th-century music and rock at San Francisco State University. He also hosts a show devoted to experimental music for KPFA in Berkeley, California.

Scott Taves *(staves@interaccess.com)* works as a consultant in the music and entertainment industries. He also writes about things you can watch, hear, and screw around with.

Rogier van Bakel *(rogiernl@aol.com)*, as anagram enthusiasts will note, has Brave Ink Galore. He is a Dutch correspondent in Washington, DC.

David Voss is the real-space manifestation of *dvoss@aaas.org* and a senior editor of the journal *Science*.

Norman Weinstein is a poet and music critic whose most recent book is *A Night in Tunisia: Imaginings of Africa in Jazz*, published by Limelight Editions.



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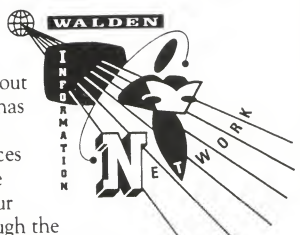

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net surf

Edited by Kristin Spence

Tune In, Turn On, and Rock Out

I've visited my share of online rest stops and scenic overviews. But since the arrival of the colossal paradigm shift that is the Web, I've noticed that my favorite haunts and mom and pop stores are now overshadowed by looming skyscrapers and less elegant strip malls. Make no mistake, the Net is open for business.

The independent music industry has long been aware of the benefits that accompany being wired, having distributed catalogs and other pieces of propaganda via ftp, e-mail, and Usenet newsgroups for years now. With the advent of the Web, more powerful and less expensive hardware, and a growth in online subscribers, it's become cheaper and easier for musicians and labels to reach a broadening online audience.

One of the first Web sites to cater exclusively to independent music was the *Internet Underground Music Archive* (*http://www.iuma.com*). Since its inception, *IUMA* has evolved from a pet project of two independent-music aficionados to a full-fledged business. Visitors to IUMA will find one of the most colorful and superbly crafted Web sites around. IUMA features MPEG2 music samples, artist bios, and album artwork of more than 400 bands. These can be browsed via an alphabetical index or, in many cases, through links to the record label's home page. IUMA also features a periodicals section. Here, one can sift through information on hip new music rags or browse the virtual pages of *Addicted to Noise*, the *Rolling Stone* of the Internet. *Version 2*, IUMA's new-and-improved-coming-real-soon-now iteration, will add online ordering capabilities to the Net soup. Ah, consumer bliss!

Not surprisingly, IUMA's success has opened the online floodgates. *Sound Wire* (*http://soundwire.com*), which started out as an online record store, has become another haven for music hounds. The graphics aren't as slick as IUMA's, but what Sound Wire lacks in aesthetics it makes up for in content.

Sound Wire is easily browsed alphabetically by artist. And, like IUMA, you can read about each band, listen to sample tracks, or check out album covers. "Joe's Picks" is another great feature: a special section in which Sound Wire chief Joe Maissel recommends his favorite new releases. Best of all, ordering via Sound Wire is simple: jump over to the online order form (you need a forms-capable Web browser like Netscape), fill in your name and address, enter the items you wish to order, and select a payment method. Sound Wire accepts VISA, Mastercard, American Express, *Netcash (http://www.netbank.com/~netcash/)*, and *First Virtual (http://www.fv.com)*. In addition, Sound Wire can handle PGP-encrypted transactions – a definite plus for anyone concerned about online security.

Finally, while both IUMA and Sound Wire offer a great deal to the independent music fan, *CDConnection* (*telnet cdconnection.com*, or check out the considerably weaker archive at *http://ftp.cdconnection.com*) and *CDEurope (telnet cdeurope.com)* are the première online record stores, offering more than 100,000 different domestic and import releases. Their interfaces will remind many surfers of the pre-Mosaic "Industrial Age" of the Net, but their selection is nothing to scoff at. Fearless Internauts, the service age is upon us. The Net is no longer just about information wanting to be free. In fact, "free" has nothing to do with it. So, surf the Net, brace yourself for the crushing wave of consumerism, and keep your credit card handy.

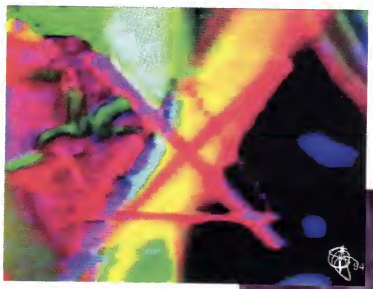
– *Robert Wyatt* (rob@bedazzled.com)

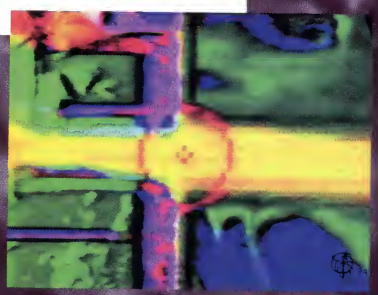
Buzzing with activity (and information), GEARS is a honeycomb dripping with bee lore. Find it at *http://gears.tucson.ars.ag.gov/*.

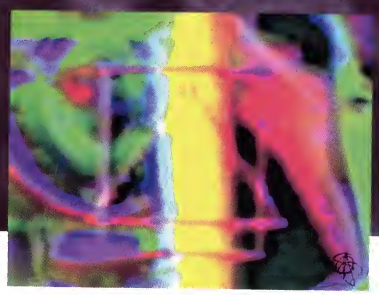
BEES: STEPHEN L. BUCHMANN

Nurse Ratchet, I Presume....

Pushed to your limit? Those voices in your head gettin' you down? Having trouble distinguishing reality from loony-toon fantasy? Sounds like it's time to check yourself in. *The Asylum* provides a comfy set of padded, virtual walls for Net brains that have been pushed too far. Amenities include a gonzo psychological questionnaire for prospective inmates and the world's first interactive Lite Brite™ server, so you can make pretty pictures in your cell while you rock back and forth. Come for a visit at *http://www.galcit.caltech.edu/~ta/cgi-bin/asylhome-ta*, but bring your own pack of Juicy Fruit.







Witness all the colors of the artistic rainbow at *http://www.art.net/visual_artists.html*.

Go Your Own Way

My cat is dead and I'm not feeling so good myself. I lost my job, my wife, my house, my friends, my refrigerator/freezer with the crushed-ice maker in the door. But I'll tell you, even though I lost the remote and the TV's been stuck on C-SPAN 2 for a week now, I refuse to completely relinquish control. I'm going out *my* way. Kaboom, baby!

Interactive Death inc. has my number – I visited its Web site and filled out a death request form. Providing they verify my payment, I'll be jetting off with Saint Peter to those pearly gates on high within the week. I had my pick of gruesome exits – beheading, lethal injection, poison gas.... I chose plastique. That's C4, and it makes quite an impression on the neighbors.

If you've decided to pass on, but worry about leaving friends or family with a messy aftermath, don't miss the cleanup service special – only US$149.95! IDi allows you to be considerate to the bitter end.

Check out at *http://webcom.com/~semicool/IDi/welcome.html*, and put that last nail in the coffin.

Honey of a Home Page

As you drizzle some honey on that slice of toast, your eye catches a headline in the morning paper: "Killer Bees Coming Our Way: California, Arizona, Texas in Danger." Not sure what to make of it all? Get your hive mind in gear and see what's buzzing at the largest collection of bee- and pollination-related information on the Web. Some of the first bees in cyberspace just went online at the Carl Hayden Bee Research Center in Tucson, Arizona. This USDA-ARS laboratory maintains a public access Web server: *The Global Entomology Agricultural Research Server* (*GEARS*). It's much friendlier than its name, and a way-cool site to boot. GEARS offers 12 browsable areas, including research, publications, beekeeping industry tips, an Internet classroom, downloadable software, insect movies, the sound room (Know what "queen piping" is? Find out here), an art gallery featuring insect photographs, plus hyperlinks to other entomology-related sites on the Web. GEARS is riddled with innovative graphics, and materials are updated weekly. Comments can be sent via *e-mail* to Mark Templin at *candyman@ccit.arizona.edu* or Stephen Buchmann at *buchmann@ccit.arizona.edu*. Make a beeline for GEARS at *http://gears.tucson.ars.ag.gov/* and have a honey of a time!

Feelin' Irie.com

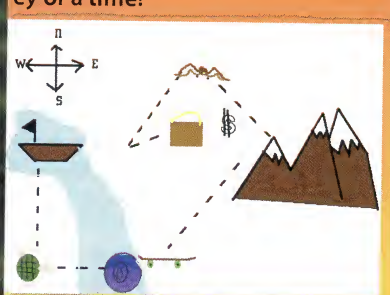
The timeless and universal Bob Marley lyric, "one love, one heart, let's get together and feel all right," resonates with a compassionate plea – one now aligning with the socially transformative powers of the Internet. As our world becomes ever more interconnected, ever more a global village, it is important that we free our minds and embrace the spirit of equality that Marley sang of.

Appropriately, a celebration of the life and accomplishments of this jamming Rastaman now shines with poetic and inspiring light on the World Wide Web. A *Marley Storyboard* collects together the shared thoughts of many who have been touched by Marley and his musical love vibrations. Pictures, music, and links to other reggae Web sites round out the tribute. Make a pilgrimage to this virtual celebration of music and love at *http://www.netaxs.com/~aaron/Marley/Marley.html*, and splash in the cyber-rasta waves.

Rawk 'n' Roll!

Fans and aficionados seeking like musical minds and ears now have a place to rap. *ROCKLIST*, a mailing list dedicated to the academic examination of popular music in all its various forms, welcomes discussion from cultural, historical, sociological, political, feminist, philosophical, and theoretical perspectives, though discussion is in no way limited to these categories.

ROCKLIST is unmoderated, allowing for the free exchange of ideas in an open and diverse environment. However, respect for others and for differing opinions is expected. Anyone with an academic or scholarly interest in popular music that both transcends and embraces fandom is welcome to join ROCKLIST. To subscribe, send an *e-mail* message to *listserv@kentvm.kent.edu* with *sub rocklist <yourfirstname> <yourlastname>* as the text of the message. To post a message to ROCKLIST, send *e-mail* to *rocklist@kentvm.kent.edu*. Questions regarding ROCKLIST should be directed to *jepstein@kentvm.kent.edu*.



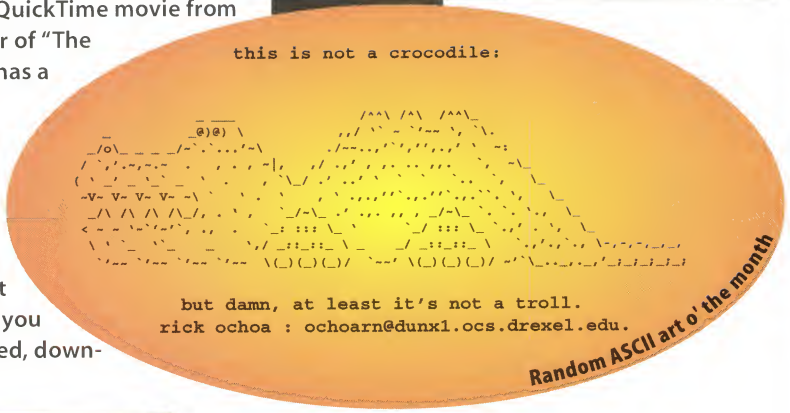
Get a sneak peek at the digital artists of the 21st century. The work of young, mouse-dragging hands can be found at *Plugged In*: *http://www.plugged.org*.

SOLDLIKEMEAT: TOM COFFIN

I Want My MTVirt Space

Animation fans should set their Web browsers to *http://mtv.com* for the best of MTV's new animation online. The site contains more than 20 QuickTime movies of *Liquid Television*, the new *Oddities* series, "The Head," "The Maxx," and more than 20 JPEG and GIF files scanned from the original cels. Also, don't skip the extensive sound library with more than 30 sound bites. You'll even find a 7-Mbyte QuickTime movie from Eric Fogel, the creator of "The Head." The Web site has a convenient high-speed or low-speed option for those of us who don't have the wondrous speed of a T1, and there is enough great stuff here to provide you with hours of fun-filled, downloading pleasure.

/pub/galactic-guide to consult the FAQ, the article archives, the PGG Report newsletter, and other vital documents. If you can access the Web, travel to any of the five different PGG Web sites, *http://www.willamette.edu /pgg/*; *http://web.cs.city.ac.uk/pgg/guide .html*; *http://www.strw.leidenuniv.nl /~vdmeulen/index.html*; *http://aurora.etsiig .uniovi.es:3080/~~pippin/*; or *http://www .realtime.net/~lthumper/*, and you'll never be lost again.

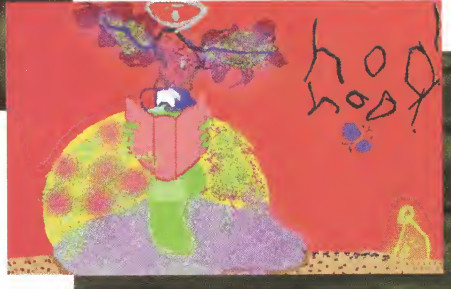


Everyone's Intergalactic Compass

If you're a surfer with time on your hands and adventure in your heart, then you're an ideal recruit! Become a field researcher for *Project Galactic Guide*. The Galatic Guide was begun in the *alt.fan.douglas-adams* newsgroup by founding father Paul Clegg. Inspired by Douglas Adams's *Hitchhiker* series, Clegg had the brilliant idea of creating an online guide to the galaxy, and so was born one of the most important and all-consuming projects to engage the minds and hearts of an élite group of otherwise idle wits.

Presently, the guide, edited by Steve Baker and Alex McLintock, contains more than 300 articles, some real, some unreal, and some semi-real (predominantly real with some references to unreal, fictional stuff).

To become a field researcher (press passes and T-shirts are in the works), hie thee to the newsgroup *alt.galactic-guide*, or visit the Mothership via *ftp* at *vela.acs.oakland.edu*



Wipeout!

• We unfortunately neglected to credit a few digital *artistes extraordinaires* in our March issue (pages 156 and 157). From left to right, the first two images were created by Brett Wagner, the third image by Ranjit Bhatnager, and the fourth by Harlan Wallach. To get to their site (*Arthole*), travel to *http://www .mcs.net/~wallach/paris/panic1.html*. Great work, guys! • Also, same issue (3.03), a typo was listed in the URL for *The Place*. The correct URL is *http://gertrude.art.uiuc.edu /ludgate/the/place.html*.

Thanks to the *Wired* 3.05 Surf Team

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Elliott Stone

How wou

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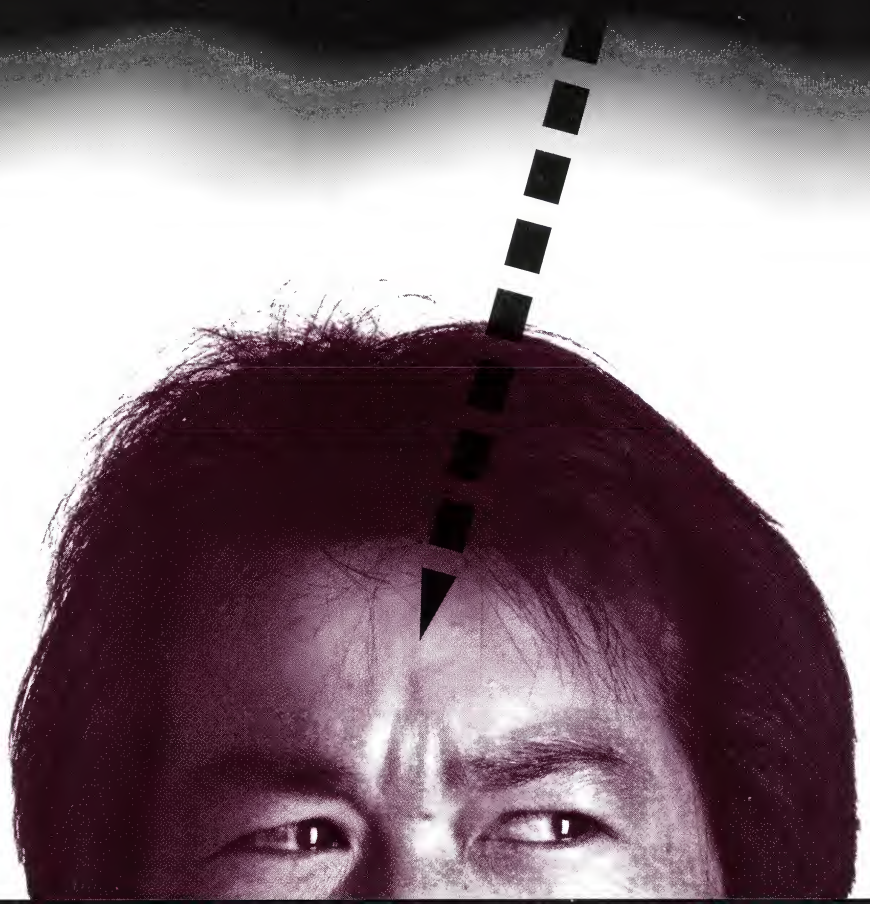

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CHIEF MANAGER,
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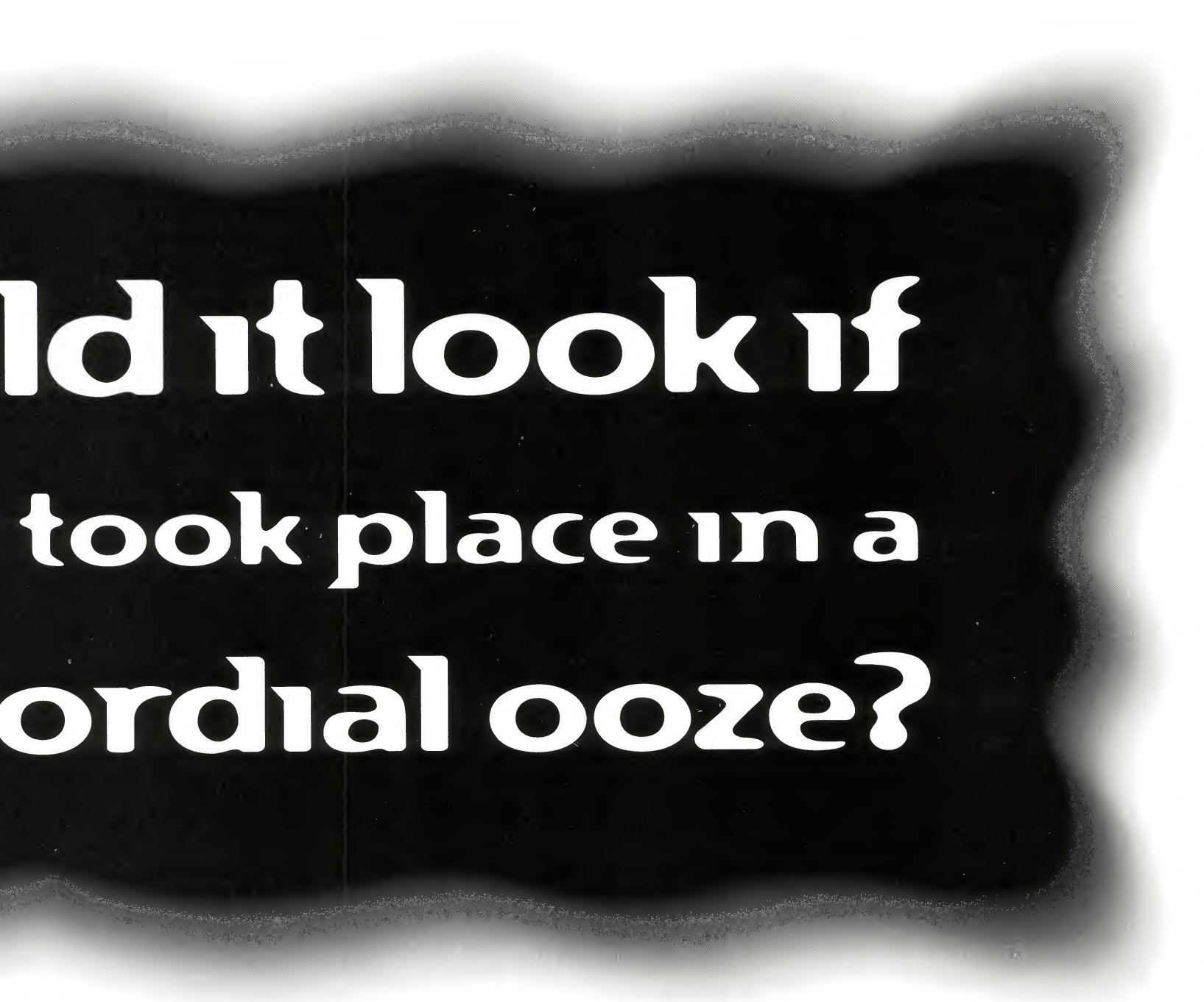

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Headed to Honolulu for INET?

OK, OK – so your idea of a Hawaiian holiday is big blue drinks on the beach at Waikīkī. Fine. But can we compromise on the blue?

Take it from me, a *keiki o ka aina*: for that mai tai, you'll want to visit one of the grandes dames of Hawaiian hotels: the **Royal Hawaiian**, the **Moana**, or the **Halekulani**. But go just before sunset: the tourists are fleeing, the pink-sailed catamarans are beaching, the outrigger canoe clubs are practicing, and the sun will soon play *hukilau*, casting its nets of color into the sky.

These hotels hark back to Old Hawai'i, and yes, there's more of a graceful past here than Waikīkī would ever suggest. Start with **Ka'ao o Honolulu**, walking tours with themes like "The Revolution of 1893" and "Ghosts of Honolulu." Then head to the **Bernice Pauahi Bishop Museum and Planetarium** for everything from the anthropological to the astronomical.

In the heart of downtown is **'Iolani Palace**, an Italianate stone, stucco, and koa-wood colossus that pays poignant tribute to Hawai'i's last monarch, Queen Lili'uokalani. The native Hawaiians' tragic story and Lili'uokalani's imprisonment in the palace will break your heart.

While downtown, stroll down **Maunakea Street**, whose turn-of-the-century stone buildings recall Honolulu as wharf town. Long renown for its *lei* shops, the area is also home to art galleries, Chinese apothecaries, and some hot (and spicy) cafés. Try **Duc's Bistro** for French cuisine *à la Viêt Nam*, or to save two bits, go to Duc's brother's place, **A Little Bit of Saigon**.

More good *kaukau* – and some jumping night life – are nearby at the **Aloha Tower Marketplace**. The **Big Island Steakhouse** is my brother's pick; Mom prefers the **Abner T. Longley Fireboat** (harbor tours narrated by local comedian K.K. Kaumanua); the critics commend **Gordon Biersch Brewery Restaurant**. But I say don't miss the free Hawaiian music on the pier every Friday afternoon.

But to taste O'ahu's best treasures, go west – through the pineapple and sugar cane fields to the North Shore and the rustic seaside town of Haleiwa (my home turf). Stop at **Megs Country Drive In** for plate lunch and don't miss the shave ice at **Matsumoto's**.

From there, head for **Waimea Falls Park**, a lovely valley with a 45-foot waterfall, botanical gardens, hula shows, and excavated ruins. **Waimea Bay** offers a 60-foot-high rock for world-class diving and an underwater *puka* you can swim through. Finally, stop at the **Pu'u o Mahuka Heiau**, an ancient lava temple perched atop a cliff. The spirits here will give you "chicken skin," the Hawaiian version of goose bumps. On the drive back, turn that radio dial to the all-Hawaiian KCCN (am 1420, fm 100.3).

When the Internet yaddah yaddah becomes a yawn, ditch the digital highway for tropical footpaths. Walk around **Makapu'u Point** or disappear into the forest via **Pu'u Ohia** (at the intersection of Tantalus and Round Top Drives) or **Manoa Falls Trail**. Go to the **Maunalani Heights** trailhead, which lies between a fence and the water tank on Maunalani Circle. Hike for hours along the spine of a ridge: the mist will beckon from atop the Ko'olau Range, lush valleys will drop off on either side, and the cyberworld will be left far, far, far behind. – *Kiakahi Hale*

THE MAY ROUNDUP (see *Wired* 3.04)
May 7-10 Cable '95; Dallas · **May 7-11** CHI '95; Denver
May 8-10 The IEEE Symposium on Security and Privacy; Oakland, California

June 7-9 **Artificial Intelligence Applications on Wall Street; New York.** Forget biz school – all you need to make it big on Wall Street is a little intelligence. Artificial intelligence, that is. This third annual event, sponsored by Pace University in cooperation with the ACM and others, draws speakers from the nerdy depths of MIT to the executive suites of Lehman Brothers. Panels cover intelligent electronic exchanges, advanced trading techniques, and new computer infrastructure. Registration: around US$500. Contact: +1 (914) 763 8820, fax +1 (914) 763 9324, e-mail *satwell@mcimail.com*.

June 20-23 **Ars Electronica; Linz, Austria.** Subtitled "Mythos Information: Welcome to the Net Worlds," the venerable Ars Electronica program delves into our postmodern information society and finds that the transition from mechanical madness to slick information machine raises many questions. Then there is the prestigious international Prix Ars Electronica, awarded to the most dazzling electronic art and – new for '95 – Web sites. Registration: free. Contact: 43 (732) 7612 271, fax 43 (732) 7612 350, e-mail *arsliva@ping.at*.

June 27-29 **Women in Technology Conference; Santa Clara, California.** Face it, if you're not an old boy, the old network doesn't work. Professional women can network, brainstorm, and – yes – vent at "Channels for Change." Famed feminist Gloria Steinem and White House scientist M.R.C. Greenwood keynote this industry event, organized by the International Network of Women in Technology. Registration: US$375. Contact: Laurie Clark, +1 (818) 990 1987, fax +1 (818) 906 3299, e-mail *witi@crl.com*.

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June 27-30 **INET '95; Honolulu.** "And what rough beast, its hour come at last, slouches towards Bethlehem to be born?" A global information beast. But at the annual Internet Society conference, Net workers investigate the theme of "The Internet: Towards Global Information Infrastructure" in an effort to tame the beast. General sessions range from network engineering and operation to policy issues and business applications. Special workshops cover the educational use of the Net and network training for developing countries. Registration: US$475 before May 26. Contact: +1 (703) 648 9888, fax +1 (703) 648 9887, e-mail *inet95@isoc.org*, WWW *http://www.isoc.org/inet95.html*.

July 5-8 **Alliance for Community Media International Conference and Trade Show; Boston.** What is the appropriate model for the information superwhatever? How can we ensure that community access and involvement are not totaled in the convergence-slash-collision of the computer and telecommunications industries? Organized by the Alliance for Community Media (originally the National Federation of Local Cable Programmers), this forum attempts to shape a democratic new telecommunications policy. Registration: US$400 until June 5, then $430. Contact: +1 (503) 233 1224, fax +1 (503) 233 0772.

OUT ON THE RANGE
July 27-31 The Fourth Quinquennial Science Studies Workshop: Humans, Animals, Machines; Bath, England. Contact: fax + 44 225 826381, e-mail *h.m.collins@bath.ac.uk*.
August 4-6 DEFCON III; Las Vegas. Contact: e-mail *dtangent@defcon.org*.
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◂ 151 In the last 15 years, music has ceased to be the center of people's cultural life. We both come from a generation in which music was where it all got acted out. The other arts were somewhat in the rear. Music has had its day. A lot of music now doesn't really have an independent existence separate from the places it's played in. For instance, a lot of rave music and ambient and trance and so on has very much to do with clubs and lots of people being together and so on. It's very context-linked. And quite often on records it sounds rather dull. I read recently that a survey revealed that the average CD was listened to two and a quarter times.

So, where has the culture recentered itself? Where is it getting acted out?

Not in any one place in particular; it's going to be in a variety of places. Theme parks are a relatively new cultural form that is going to become more and more a place for artists to look. A theme park, of course, is a multimedia experience wherein you can use any sense you like.

My guess is that the cultural center might settle onto MUDs. They are online theme parks. Not-quite-virtual realities that can be done on a screen, without goggles and gloves. They will have all the richness and emotional power and generational identity that music gave us. A vast visual MUD – where you can explore a world that you can also partly make, if you care to – will become the center for a new youth culture.

I absolutely agree. I think that prediction's right on. And I'll make another one as well: More Court TV! Court TV gets dismissed as mere voyeurism, but voyeurism is never *mere:* you're only voyeuristic about things that you are very interested in. You're not voyeuristic about things that bore you. I think what Court TV indicates is that people are fascinated by these new moral problems that are coming up.

Each one of those big trials – William Kennedy Smith, the Menendez brothers, Lorena Bobbitt, and now O.J. Simpson – represents critical moral issues. What are the relationships between people at the moment? Are moral relationships the same as legal ones? Or do they overlap? Or are they different? I think people are fascinated by these problems, and I'm glad they are. That's another big future as well. Today, gossip is philosophy.

Breeding art

What kind of advice would you give to a musician now starting off, figuring that she or he may come to a peak in 10 years?

Oddly enough, I rarely talk to young musicians, but I talk to many young painters, because I teach in art schools. I ask them: Why do you think that what you do ends at the edges of this canvas? Think of the frame. What frame are you working in? Not just that bit of wood round the edge, but the room you're in, the light you're in, the time and place you're in. How can you redesign it? I would say that to musicians, too. I see them spending a lot of time working on the internal details of what they're doing and far less time working on the ways of positioning it in the world. By "positioning it" I don't only mean thinking of ways of getting it to a record company, but thinking of where it could go, and where it fits in the cultural picture – what else does it relate to?

One of the ways of rethinking the frame is to evolve art. I have in mind an exhibit I saw of Karl Sims's genetically evolved computer graphic images. They were *stunning!* One after another, they would come up, grown by his machine. And you would see pictures that neither you nor nature could have imagined. A really good music machine could do the same thing.

That's exactly what I hope for. Interestingly, systems and rules in music allow you to come up with things that your sense of taste would never have allowed you to do. But then your sense of taste expands to accommodate them! For instance, I'm sitting here now looking at something that my Stained Glass machine just made on my monitor. It has color combinations in it that are *so* weird. I would never *dream* of putting these things together. But, soon they start to look pretty good, and then they start to look *really* good.

My theory is that almost anything that can be evolved will seem beautiful.

Absolutely right. This is the reason that that damn Stained Glass screen saver thing works so beautifully. Because it's the only one that has any evolutionary qualities to it. Most attempts to mechanically manufacture music are apt to fail because they are modeled to create sameness, whereas what interests us is difference. Having said that, I'm quite keen on the idea of evolutionary music because it doesn't attempt to base itself on some sort of absolute theory about what makes *good* music. We can still say we don't really know what makes music nice, but we know when we like it. So we'll feed some into a processor and see if it can sort of breed some new versions of it that we haven't heard before.

I have discovered three uses for artificial evolution as a tool. One is to bring you to somewhere you would not have thought of – to evolve a pattern, or an organism you couldn't dream of. The second use is to generate the details that you would not ordinarily have time to even conceive doing – to mutate out a pattern in ways that you just do not have time to do alone. And the third, and most powerful, is to create new spaces to explore.

If I could suggest a reason for wanting to make music machines, the reason would be to do these things. Not to replicate music, but to invent new experiences completely.

You've seen the software Photoshop, right? It not only gives you tools that bridge painting and photography, it also contains a program that lets you mutate and evolve textures. It's like the invention of oil paint and horticulture combined! But so far there is no one, not even bad artists, attempting to create major art with it.

I've become rather engrossed with Photoshop in my own work. My first reaction is the same as yours: "My god – with these tools, the whole look of design should have changed. Why hasn't it?" The answer is generally that, as with all computer-based things, the technology filters out most of the interesting people, and forces them to wait. It takes immense amounts of time to trawl through the dreadful manuals and engage in conversations with the addled numbskulls who get enthusiastic about this crap. Only nitwits make it through (with enormous exceptions, of course), since only they have that kind of time to spare.

Surfing on entropy

You seem to have a fondness for engineering. Why aren't you afraid of machines?

I'm lazy; that's why I like machines. They do things I would not have thought of. I can put things into them, and then I can see something happen there beyond what I would have had the time, the taste, or the 206 ▸

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◂ 204 endurance to have produced myself. I usually don't want to slavishly make something in detail. I want to produce the conditions from which *it* and many *its* could come into existence. I think of myself as a machine builder in a way. Making a record for me is inventing a way of making music. And once I've tried
it a few times, I want to invent another way. The thrill for me is to think of new ways of doing it, and new places to do it, and new sites in which music might happen, and new ingredients that might be used in it, and so on. So, machines are very much part of what I do.

Do you think of *yourself* as a machine?

I try to, but I'm not very successful at it!

In a lot of the art community, "mechanical" is a dirty word. You seem to have sort of flipped it around, using "mechanical" as a good, useful, and positive word.

"Machine" has come to have a dirty connotation because it's come to mean systems that do predictable, boring, and repetitive things. But the machines that *I'm* talking about do things we didn't expect. The lesson of complexity theory: allow some simple systems to interact – watch the variety evolve.

Has computer science influenced you any?

Cybernetician Stafford Beer had a great phrase that I lived by for years: Instead of trying to specify the system in full detail, specify it only somewhat. You then ride on the dynamics of the system in the direction you want to go. He was talking about heuristics, as opposed to algorithms. Algorithms are a precise set of instructions, such as take the first on the left, walk 121 yards, take the second on the right, da da da da. A heuristic, on the other hand, is a general and vague set of instructions. What I'm looking for is to make heuristic machines that you can ride on.

Doesn't that make things out of control?

People tend to think that it's total control or no control. But the interesting place is in the middle of that.

Right. We have no word for that state of in-between control. We have some words like "management," or "herding," or "husbandry." All these are words for co-control.

I call it "surfing." When you surf, there is a powerful complicated system, but you're riding on it, you're going somewhere on it, and you can make some choices about it.

I think I know what you mean. Artificial life researchers talk about surfing the wave of increasing complexity. A very complex system gets close to a certain edge between rigid control and utter chaos – that's when the whole thing can surf to the next level of complexity. They see this in evolutionary systems. Some go as far as to say that's what life does: surf on entropy.

I like that. Metaphors involving the sea are very powerful to me. You have this interesting conflict – a sense of direction, a need to get somewhere, but in a medium that has its own, probably different, sense of direction. You can use the piggyback power of that medium, but you have to keep paying attention, making your own adjustments. Unless you really do want to go with the flow.

Leaving things alone

You once went around asking various bands to pretend they were an African robot factory and you had them make the sounds they imagined hearing in such a place. Did anything ever come of that?

Yes. Some of the tracks on my album *Nerve Net*. That's a technique I now use when I'm producing. I try to *imagine* us in a playing situation of some kind. The most important thing you can say to people when they're working is to forget about music. Really. I can't *stand* people thinking about music in the studio. People with musical instruments should be banned from recording studios because they so often center the process around history. They know all the tricks to make things that sound like music. But what I want to do is to make an experience of some kind. And we happen to have these tools to do it with, which happen to be called musical instruments, or recording studios, or whatever. If you can really get this message across, of making an experience instead of music, it's extremely liberating to people.

There are different ways of doing this. On the new work I've been doing with David Bowie, I wrote some "roles" and "scenarios" for the musicians – there were six of us – and we each played out our individual roles. The interesting catch was that no one knew what role anyone else was playing. One scenario, for example, suggested: You are a player in a Neo-M-Base improvising collective. It is 1999, the eve of the millennium. The world is holding its breath, and things are tense internationally. You are playing atonal, ice-like sheets of sound that hang limpid in the air, making a shifting background tint behind the music. You think of yourself as the tonal geology of the music – the harmonic underpinning from which everything else grows. When you are featured, you cascade through glacial arpeggios – incredibly slow and grand, or tumbling with intricate internal confusion. Between these cascades, you fire out short staccato bursts of knotty tonality. You love the old albums of The Mahavishnu Orchestra.

I can hear the music now!

The other thing I say is, Think about landscapes. Forget that we're making a song. Think we're making the sound of a landscape. So I paint a scene. I say we're on the outskirts of a big industrial city, an old city with lots of smokestack industries. We're just in the country. It's dark, but we can still see the flames and steam coming out of those things to our left, and to the right there's just darkness. Then when I say, OK, let's make the soundtrack for that movie. People start playing in a completely different way and find resources of playing they didn't know about at all. For instance, in Laurie Anderson's studio, we would spend a lot of our listening time staring out of the window over the water, watching huge boats drift noiselessly into the harbor. For a few days, we followed a rule that everything we made had to make sense with that view. It was liberating in that it allowed us to accept some quite "unmusical" things – because they worked with the view.

Since you're asking musicians to forget about the history of music, why don't you just cut to the chase and work with nonmusicians?

Nonmusicians often respond to it much better. Because a nonmusician is thrilled to be doing music and is quite happy to sit there and plunk one note all day. And is very alert to the effect of that. Nonmusicians really *listen* sometimes, because that's the only thing they have available to them. Musicians very often don't listen; they work from the program, and the program says move your fingers fast or whatever. Of course, as a now-experienced maker of records, I'm as suscep-

Art is not dangerous.
Art doesn't make any difference.

tible to this inattention and working-to-formula as anyone else.

It seems as if a tone-deaf hacker might do just as well as a concert violinist in the setting that you're proposing.

There's an axis between musicians and nonmusicians, and I tend to pick people right across the axis. Nonmusicians have a certain freshness. On the other hand, of course, a really *good* musician will not only listen but will be able to isolate and develop whatever is peculiar and interesting about what he or she is doing. A really good musician is not embarrassed to play something simple, and will play it well. Ideally, what you want to have are systems for switching you between the very different roles of creative-person-who-wants-to-try-lots-of-clever-new-tricks and listener-who-wants-a-moving-experience. In fact, pop music is *extremely* sponge-like in terms of the talents it uses. Pop music can absorb so many peculiar talents, ranging from the completely nonmusical poseur who just uses music as a kind of springboard for a sense of style, to people who just love putting all that complicated stuff together, brick by brick, on their computers, to people like me who like playing conceptual games and being surprised. I mean, calling it "music" is really sort of a mistake. It's drama with noise.

What is your role when you are in a studio?

Funnily enough, a lot of what I find myself – surreptitiously – doing as a producer is thinking of elaborate diversionary tactics designed to make us leave things alone – at least long enough to listen to them as "audience." I find that when you're listening with a view to doing further work, you don't generally hear the totality of something but just the little gaps where you could squeeze in something else. Audiences, I find, nearly always appreciate more space and emptiness in a work than the creators of those works would like to tolerate. I noticed this first when working with tape recorders in the early days – that, having made something, I preferred hearing it at half its original speed: twice as empty.

Is that what you call yourself these days, a producer? What is your job?

[Laughs.] I have often wondered! As a producer, I'm not just saying, Oh, let's get a good bass drum sound. I'm saying, OK, look, this thing you're doing now is hinting at a certain universe of things that I believe are connected. A frame maker is another way of describing my role: "OK, let's put a descriptive frame around this, look at everything that we've included inside our frame, and see how those things relate to one another. And what if we extend the frame to include all these other possibilities?" Of course, at the time you do it, it looks like you're including more marginal things in it. For example, when I first started making records, it was unusual for someone to come into the studio without a prewritten piece of music, to sit there, as I did, and make it up with whatever was there. Now it's how nearly everybody works. People hardly ever go into a studio with completely prewritten material now. Those kinds of innovations always look marginal at the time, but in fact often become central later on.

Would the frame-identifying role be relevant to all types of artists?

Yes. An artist is now a curator. An artist is now much more seen as a connector of things, a person who scans the enormous field of possible places for artistic attention, and says, What I am going to do is draw your attention to *this* sequence of things. If you read art history up until 25 or 30 years ago, you'd find there was this supposition of succession: from Verrocchio, through Giotto, Primaticcio, Titian, and so on, as if a crown passes down through the generations. But in the 20th century, instead of that straight kingly line, there's suddenly a broad field of things that get called art, including vernacular things, things from other cultures, things using new technologies like photo and film. It's difficult to make any simple linear connection through them.

Now, the response of early modern art history was to say, Oh, OK. All we do is broaden the line to include more of the things we now find ourselves regarding as art. So there's still a line, but it's much broader. But what postmodernist thinking is suggesting is that there isn't *one* line, there's just a field, a field through which different people negotiate differently. Thus there is no longer such a thing as "art history" but there are multiple "art stories." Your story might involve foot-binding, Indonesian medicine rituals, and late Haydn string quartets, something like that. You have made what seems to you a meaningful pattern in this field of possibilities. You've drawn your own line. This is why the curator, the editor, the compiler, and the anthologist have become such big figures. They are all people whose job it is to digest things, and to connect them together.

Do you worry about everybody being a curator and nobody creating anything?

To create meanings – or perhaps "new readings," which is what curators try to do – *is* to create. Period. Making something new does not necessarily involve bringing something physical into existence – it can be something mental such as a metaphor or a theory. More and more curatorship becomes inseparable from the so-called art part. Since there's no longer a golden line through the fine arts, you are acting curatorially all the time by just making a choice to be in one particular place in the field rather than another.

In the traditional classical view, art objects are containers of some kind of aesthetic value. This value was put into them by the artist, who got it from God or from the Muse or from the universal unconscious, and then it radiated back out to those who beheld it. It was thus that missionaries played gramophone records of Bach to Africans in the expectation that it would civilize them, as though they would somehow be enriched by the flood of goodness washing over them. We now see the arrogance of this assumption, but I think few people understand what is *really* wrong about it, aside from its political incorrectness. What's wrong about it is that cultural objects have no notable identity outside of that which we confer upon them. This is a controversial and volatile statement. Their value is entirely a product of the interaction that we have with them. Duchamp's urinal was an exercise in this. Things become artworks not because they contain value, but because we're prepared to *see* them as artworks, to allow ourselves to have art experiences from them, before them, to frame them in contexts that confer value on them.

Machines do things I would not have thought of.

Sometimes I get the sense that you could just as easily have been a scientist. What do you think artists are doing that is different from science?

Interesting question. I think that art is not dangerous.

You say art is *not* dangerous?

The whole point of art, as far as I'm concerned, is that art doesn't make any difference. And that's why it's important. Take film: you can have quite extreme emotional experiences watching a movie, but they stop as soon as you walk out of the cinema. You can see people being hurt, but even though you feel those things strongly, 208 ▸

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◄ 207 you know they're not real. You know they've been put on for you. And you know that you've agreed to participate in them. Artists deal in this rather nebulous area I call "the rehearsal of empathy." You're rehearsing a repertoire of feelings that you might have about things, of ways of reacting to things, of how it would feel to be in this situation. How it would feel to be in that person's place? What would I have done? Such questions are the most essential human questions because they deal with how we negotiate as mental beings through a complicated universe. A lot of what's learned is quite uncodifiable, because it isn't the *same* for everyone. In fact, nothing's ever the same for anyone – and those very individuated reactions don't fit well into a scientific frame. Just as complexity theory has helped us understand that linear systems are a very special and limited case, so in some senses we see that the whole of science must deal with special and limited cases. But experiences of culture prepare us for acts of improvisation by getting us used to the idea of enjoying uncertainty.

Even your extremely logical denial is structured in a scientific way!

I've been involved with people in the sciences all my professional life because they have a lot of metaphors that I find useful. Take the book *Fuzzy Logic* by Bart Kosko. That's a great metaphor. You don't even have to read the whole book to be able to use that idea. Same with complexity. The idea of the cusp between chaos and stasis is such a useful idea to artists.

Designing music

How is technology changing music?

It's making it a lot easier to leave out the tracks I don't like! Before we had the record, music was an entirely ephemeral art. You were lucky if in your lifetime you heard a piece of music, especially a concert piece of music, more than half a dozen times. It would be an *enormous* thing for someone to hear, say, Beethoven's Fifth six times in a lifetime. So, what happened with recording is that suddenly you could hear exactly the same piece of music a thousand times, anywhere you chose to listen to it. And this of course gave rise to a whole lot of new possibilities within music. I think the growth of jazz, especially improvised jazz, was entirely due to recordings, because you can make sense of something on several hearings – even things that sound extremely weird and random on first hearing. I did an experiment myself last year in which I recorded a short piece of traffic noise on a street. It's about three and a half minutes long, and I just kept listening to it to see if I could come to hear it as a piece of music. So, after listening to this recording many times, I'd say, Oh yes, there's that car to the right, and there's that door slamming to the left, and I would hear that person whistling, and there's that baby coming by in the pram. After several weeks, I found I loved it like a piece of music.

Forget that we're making a song. Think we're making the sound of a landscape.

This future signals the breakdown of the singularity of the musical event. We can begin to see this in pop music, which is sort of fast and dirty. In the past, you would release a single, and then you'd release an album and the single would be on it. And then people started getting a bit more adventurous: they would release a different version on the single than on the album. Now people release an *unbelievable* number of things. They'll release six different versions of the single, then somebody else will do 12 different remixes of it, then it will come out another way a year later, then someone will change it 'round a couple of years after that. So, you don't have any sense of a specific identity for this piece of music. It becomes a description of a listening space that can be explored in different ways. We're back to hypertext again. I am sure this is going to be a very big part of the future.

There seems to be another trend. Music has moved from being something you heard occasionally to something that has infiltrated every waking moment of our lives. We get it on the news, in cars and elevators, at sports games and in stores, where we work, and on our bedroom clock radios. What will happen when music becomes ubiquitous 24 hours a day?

Of course, it may sacrifice some emotional power, but I sometimes imagine it may start to gain a kind of linguistic power – universality, specificity. As it becomes ubiquitous, people will want music purpose-designed much more. Just as you choose to arrange things and colors in your house in a particular way, I think you will choose music like that. Imagine that you order an evening of music over the Net. You say, "We're having a dinner, people should be able to talk over the music, I'm fond of Pachelbel's Canon and Joni Mitchell and Miles Davis. Can you put together three hours for me?" Whereupon the brain of the system looks through its ever-evolving "taste-clumps" – the product of continuous customer research – and says, "Someone who likes those things is quite likely to also enjoy some of the quieter moments of Hector Zazou, Jane Siberry, and Jon Hassell." It will compile a combination of all those. This is an autocurator. You could even tell it how experimental you wanted it to be: "Really surprise me – pull out a few long shots."

There is a book called *Elevator Music* that calls elevator music and Muzak "furniture music" – utilitarian fixtures of our environment. It says more is going on in that kind of music than most people think.

Yes! I'm always thrilled when someone suddenly says, Hey! you can take this seriously as well. It's like a new piece of the world that suddenly opens up for you.

So what kind of cultural margins do you think we should be taking seriously now? I'm trying to take videogames and videogame music seriously. Videogame music is not music that I would listen to as on a CD, but automatically evolved video music would be a million times better than having to hear that idiot music that repeats itself over and over again. The number of hours that people listen to Mario Brothers music is probably greater than the total number of hours that people listen to Beethoven.

That's probably true.

The total number of hours that people are listening to game music probably exceeds all hours spent listening to classical music, so it's very important that there be some kind of mechanical music worth listening to. I see a place for machine music as somewhere between the handcrafted music sold on albums, and pure, canned, inane, repetitious stuff. Ideally, what we want in a videogame or an interactive experience is automatic music that's adjusting in real time to what we're doing. The music is *changing* depending on what's happening on the screen.

Automatic music becomes interesting when it does something we didn't expect. Yet mere "didn't expect" isn't good enough – we have to already have a framework of expectations against which to be surprised. That framework can be simple – such as one's sense of wonder when the tape loops in Steve Reich's "It's Gonna Rain" mysteriously recombine to produce something apparently quite different from what they are. That's a surprise of synergy. Another kind of surprise is that of extension – such as when Dorothy Love Coates collapses down to that beautiful, heartbreaking low note in "Lord Don't Forget about Me," just when you thought she could never go any lower. That kind of surprise is difficult to get from a machine, because it depends so much on our empathy with another human, and on our belief that this music represents some feeling that a human is having or could have.

Of course, a lot of the remixing of musical tracks – which is so fashionable now – has an automatic music feel about it: spin a few samples and see what they do together.

The other thing about all this remixing is, who keeps track of the intellectual property rights as bits of music are passed from studio to studio?

Intellectual rights is the hottest area going, and certainly not only in music. There are so many uniquely new problems. For example, I think of producing as the act of creating a sonic and conceptual overview of the record. And this type of creation is a whole new category for which there is no current copyright arrangement. When you're using sophisticated tools with very strong personalities, is the designer of the tools in some sense responsible for what finally comes out? Should that designer benefit? When a new tool or technology comes into existence, and suddenly 50 people at the same time see the same obvious idea, is it right that the one who gets to the publisher or patent office first should get all the material benefits of that idea? If not, how else do we share it?

I'm impressed with Bruce Sterling, the science fiction writer. He's loaded much of his nonfiction writing onto the Net. He says, in effect, This is copyrighted, but you can make a copy of it for noncommercial reasons; go ahead, he says, spread it around. He calls it Literary Freeware. He *encourages* people to make a copy of a book of his that is still in print.

I've always thought one of the most fantastic things about the Grateful Dead was that instead of sending heavies down into the crowd to smash people over the head and take their cassette recorders, they offered them a nice board to plug into so at least they got a decent recording.

I'm curious about the economic motives of artists in these technological times. At the first hearing, ambient music sounds like music that was made because it could be made. When you were first making ambient music, did you expect anybody to buy it?

Yes! As with everything I do, I expected it to be tremendously successful. [Laughs.]

What led you to believe anybody else wanted to listen to that kind of music, as it was so mechanical and not fashionable?

I'll tell you what it was. It was based on an observation that my tastes aren't that different from other people's. I always know that if I like something now, enough other people are going to like it soon enough. For instance, when I got into female body builders, every guy I knew was saying, Oh god! It's gross! I said, Oh yeah, this is just the last wall of resistance before they finally admit that they think these women are enormously sexy. Sure enough, they do now. I just admit to my tastes sooner. I don't have any embarrassment about what I like. It doesn't threaten what I've liked before even when it appears completely inconsistent with it. I don't mind the tension, and I don't think I have to compromise my whole theory of life to accept this thing. If I'm attracted to something, I immediately surrender to it. I offer no resistance to being seduced. Because I offer no resistance, I think that I sometimes touch things more quickly than other people do. ■ ■ ■

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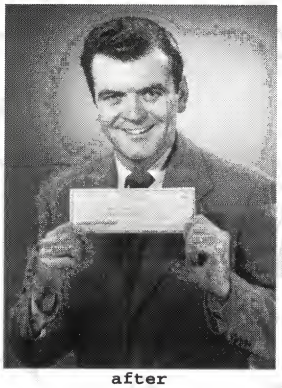
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Paine

◄ 158 and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property."

Herewith, to be put under your protection, some of the more striking connections between the Net and its rightful intellectual father.

Paine called for a "universal society," one whose citizens transcend their narrow interests and consider humankind as one entity. "My country is the world," he wrote. The Internet has, in fact, redefined citizenship as well as communications. It is the first worldwide medium in which people can communicate so directly, so quickly, so personally, and so reliably. In which they can form distant but diverse and cohesive communities, send, receive, and store vast amounts of textual and graphic information, skip without paperwork or permission across borders. Where computers are plentiful, digital communications are nearly uncensorable.

This reality gives our moral and media guardians fits; they still tend to portray the computer culture as an out-of-control menace harboring perverts, hackers, pornographers, and thieves. But Paine would have known better. The political, economic, and social implications of an interconnected global medium are enormous, making plausible Paine's belief in the "universal citizen."

He would recognize its style and language, too. Paine believed that journalists should write in a short, spare, unadorned language that everyone could understand. He was the first modern political writer to experiment with the art of writing democratically and for democratic ends, writes John Keane in *Tom Paine: A Political Life* (the newest and perhaps best of the Paine biographies). Paine hammered out his own colloquial style that eschewed "purple passages, sentences without meaning, and general humbug" because he considered it the highest duty of political writers to irritate their country's government.

Reading Paine is eerie after spending time online and in political conferences on The Well, say, or after poring through the most provocative BBS postings. From reasoned arguments to raging flames to the staccato shorthand (LOL, IMHO) of countless e-mailers, digital communications are spare, blunt, economical, and efficient. Paine's style is the style of the Internet; his succinct voice and language could slip comfortably into its

debates and discussions.

Paine would understand, too, the loner at the heart of computer lore. Many of the teenagers, academics, and visionaries who pioneered the computer culture see themselves, and have been seen by others, as nerds or misfits – outcasts alone in their labs, bedrooms, or garages.

Paine met with, corresponded with, and plotted with and against some of the most powerful people of his time, from George Washington to Napoleon. But he never partied at Mount Vernon or Fontainebleau and he has never joined the gallery of heroes whose statues adorn Washington's marble halls. He saw the world with agonizing clarity, but never figured out how to live comfortably in it.

His rare social appearances were uncomfortable. He never danced or joked much, and he dressed frumpily and simply in an era of frilly pomp. He never spoke or wrote about the worst personal tragedy in his life, the death in childbirth of his first wife, Mary Lambert, and their child. Friends claimed Paine seemed to hold himself responsible for the deaths in some way. His second marriage was brief and unhappy. For the rest of his life, he was an unyielding ascetic, one of the earliest supporters of women's rights but an asexual man who spent most of his time around men.

He seemed lost without a repressive regime to undermine, disconnected if the conversation didn't revolve around politics. He hated small talk. A friend described him at one party as a "solitary character walking among the artificial bowers in the gardens." Paine, said the friend, "retired frequently from company to analyze his thoughts and to enjoy the repast of his own original ideas." He seemed at ease only when writing and railing against various forms of tyranny.

Where would Tom Paine go today for some serious rabble-rousing?

To get any real attention on TV or in the papers, he'd have to march, blockade, or burn something. Maybe he would try to get through to a radio talk show or *Larry King Live*. But if he had a computer and a modem, he could instantly spread his message. Anyone online can recognize the idea – suddenly in circulation again – of countless ordinary people participating in public opinion, their ideas "expansible all over space."

Net culture, as it happens, is an even greater medium for individual expression than the pamphlets cranked by hand presses in colonial America. It swarms with the young and the outspoken. Its bulletin boards, conferencing systems, mailing structures, and Web sites are crammed with political organizations, academics, and ordinary citizens posting messages, raising questions, sharing information, offering arguments, changing minds. From thousands of newsgroups to the vast public-opinion forums growing on giant bulletin boards, the Internet would give the old hell raiser's unhappy spirit a place to rest.

Cyberspace, not mainstream media, would be Paine's home now. Commentary has virtually vanished from TV, and the liveliest newspaper Op-Ed pages are tepid compared to Paine's tirades. But online, millions of messages centering on the country's civic discourse are posted daily, in forums teeming with the kind of vigorous democratic debate and discussion that Paine and his fellow pamphleteers had in mind. Gun owners talk to gun haters, people in favor of abortion message people who think abortion is murder, journalists have to explain their stories to readers, and prosecution and defense strategies in the O.J. Simpson trial are thrashed out.

If Paine would feel at home there, he would also fight to protect this nascent medium. Learning what had happened to the media he founded as corporations moved in, he would spot commercialization as Danger Number One. He believed in a press that was not monopolistic but filled, as it was in his time, with individual voices; one that was cheap, accessible, fiercely outspoken. He believed that media like the Net – many citizens talking to many other citizens – were essential to free government.

He was right: journalism's exclusion of outside voices and fear of publishing any but moderate opinions has made it difficult for the country to come to grips with some of its most sensitive issues – race, gender, and violence. Media overwhelmed and monopolized by large corporations, inaccessible to individual people and motivated primarily by profit, is the antithesis of Paine's life, his work, and his vision for the press.

We could use his clear direction at a time when mainstream journalists are losing their ethical grounding. Some of the most visible reporters accept fat speaking fees from lobbyists and associations whose issues they often cover. They accept money to appear on quasi-entertainment panels where they pretend to be passionate and argue the issues of the day.

Paine would never appear on talk shows or garner fat speaking fees. At one point during the Revolutionary War – when he was completely broke, as usual – he was offered a thousand pounds a year by the French government to write and publish articles in support of the Franco-American alliance against Britain. He said no. He told friends that the principle at stake – a political writer's ability to express opinions free of any party's or government's taint – was sacred, even if it meant being a pauper. And for him, it did.

During his life, his value system remained intact. Shortly before he died, bedridden, penniless, and mostly alone, he fired off a note to an editor in New York City who had messed with the outspoken prose in one of Paine's final essays for the *American Citizen*.

It is almost impossible, today, to imagine the impact of *Common Sense*. America's first bestseller, it sold as many as half a million copies in its first year.

"I, sir," Paine wrote, "never permit anyone to alter anything that I write; you have spoiled the whole sense that it was meant to convey on the subject."

His deathbed scene was perhaps the greatest example of Paine's refusal to compromise.

Lapsing into unconsciousness, in agony from gangrenous bedsores, Paine woke occasionally to cry "Oh, Lord help me! Oh, Lord help me!" Convinced that Paine's time on earth was nearly up, a physician and pastor named Manley took advantage of one of Paine's last lucid moments to try to save his soul. "Allow me to ask again," Manley inquired, "Do you believe – or let me qualify the question, Do you wish to believe that Jesus Christ is the son of God?"

Incapable of acquiescence, even when it might have provided him some comfort, Paine uttered his quiet last words: "I have no wish to believe on that subject."

Small wonder one colonial wrote of him: "The name is enough. Every person 212►

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Paine

◂ 211 has ideas of him. Some respect his genius and dread the man. Some reverence his political, while they hate his religious, opinions. Some love the man, but not his private manners. Indeed he has done nothing which has not extremes in it. He never appears but we love and hate him. He is as great a paradox as ever appeared in human nature."

It's easy to imagine Paine as a citizen of the new culture, issuing his fervent harangues from *http://www.commonsense.com*. He would be a cyber hell raiser, a net.fiend.

Picture him logging on from the small brown wooden cottage still standing on his New Rochelle farm – the one given him by New York State in appreciation of his services during the Revolutionary War. He would get up late, as always, breakfast on his customary tea, milk, and fruit. The six chairs downstairs would be piled high with pamphlets, magazines, printouts, discs, letters, papers, tracts, and research. Technologically challenged, Paine would have an older Macintosh he'd be loathe to replace. A friend would have given him the screen saver with the flying toasters, which he would scoff at as frivolous but love dearly. Friends, surely, would also have given him a PowerBook to write on when he had to retreat to his sick bed.

He might belong to contentious conferencing systems like The Well or Echo, but he would especially love cruising the more populist big boards – Prodigy, CompuServe, America Online. He would check into *Time Online*'s message boards and tear into Republicans and Democrats daily. He would e-mail the *New England Journal of Medicine* his tracts on the spread of disease, and pepper *Scientific American*'s home page with his ideas about bridges.

He would bombard Congress and the White House Internet site with proposals, reforms, and legislative initiatives, tackling the most explosive subjects head-on, enraging – at one time or another – everybody.

The Net would help enormously in his various campaigns, allowing him to call up research papers, download his latest tract, fire off hundreds of angry posts, and receive hundreds of replies.

They would hear from him soon enough in China and Iran, Croatia and Rwanda. He would not be happy to find a Royal Family still reigning in England, but he would be relieved to see George III's heirs reduced to tabloid fodder. And he'd delight in seeing France a republic after all. He would emit nuclear flames from time to time, their recipients emerging singed and sooty. He would not use smileys. He would be flamed incessantly in turn.

He would be spared the excruciating loneliness he faced in later life on that modest farm, where neighbors shunned him, where visitors rarely came, and where he pored over newspapers for any news of his former friends' lives. No longer an outcast, thanks to the Net, he would find at least as many kindred spirits as adversaries; his cyber mailbox would be eternally full.

It is here, perhaps, that the gap between Paine's tradition and modern journalism seems the most poignant and stark. Journalism no longer seems to function as a community. Since it no longer shares a definable value system – a sense of outsiderness, a commitment to truth-telling, an inspiring ethical structure – journalists seem increasingly disconnected from one another as well as from the public.

Paine would greatly prefer the chat room to the cocktail party. His spare, direct writing would work beautifully on the Net.

Online, feuds rage and people storm at one another, but the vast digital news and information world contains many distinct communities. On bulletin boards and conferencing systems, there is already a moving and richly documented tradition of rushing to one another's assistance, of viewing oneself as part of a collective culture. In America's media capitals – New York, Washington, and LA – there seems to be no such sense of common ground.

Paine in particular might not find much friendship from other journalists. He would hate Manhattan media movers and shun them like the plague.

Paine would greatly prefer the chat room to the cocktail party. His notions of spare, direct writing would work beautifully on the Net, permitting him productivity and an audience even after his gout made traveling difficult. He would find himself, in fact, embarking on

his greatest dream, to become a member of a "universal society, whose mind rises above the atmosphere of local thoughts and considers mankind, of whatever nation or profession they may be, as the work of one Creator."

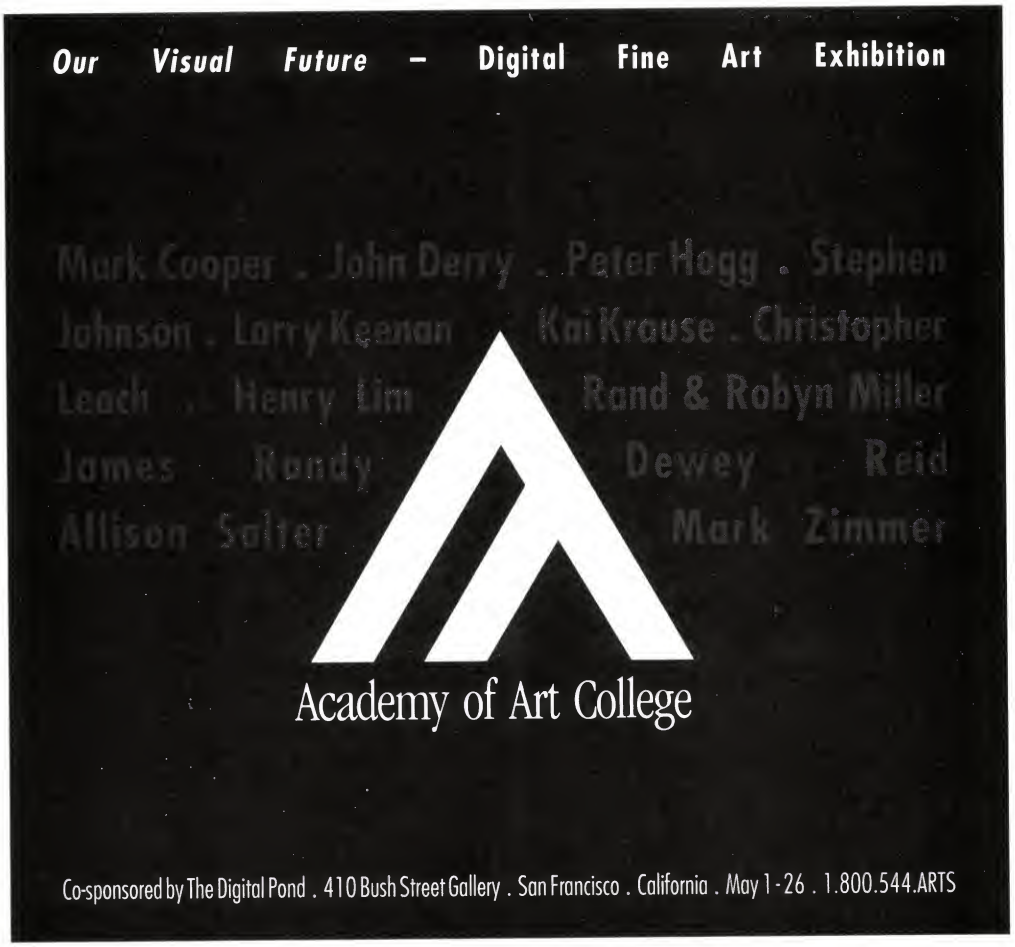
Life might be easier for him, but it would not be easy. Intense personal relationships would still elude him, but he seems a good candidate for one of those online romances that flourish all across cyberspace. Like some of his Net successors, his social skills were not substantial. He would still be reclusive and moody, too offensive to have dinner with Bill and Hillary, too combative to be lionized by academia, and too ornery to get hired by major media outlets. He would probably find most of today's newspapers unbearably bland and write angry letters to editors canceling his subscriptions.

He and the massing corporate entities drooling over the Net would be instantly and ferociously at war as he recognized Time Warner, TCI, the Baby Bells, and Viacom as different incarnations of the same elements that scarfed up the press and homogenized it. He'd have lots to say about the so-called information highway and the government's alleged role in shaping it. One of his pamphlets – this may be the only thing he'd have in common with Newt Gingrich – would surely propose means of getting more computers and modems into the hands of people who can't afford them.

Instead of dying alone and in agony, Paine would spend his last days sending poignant e-mail all over the world from his deathbed via his PowerBook, arranging for his digital wake. He'd call for more humane treatment for the dying. He'd journal online about the shortcomings of medicine and the mystical experience of aging, while digging into his inexhaustible supply of prescriptions for the incalculable injustices that still afflict the world.

I know not whether any Man in the World has had more influence on its inhabitants or affairs for the last thirty years than Tom Paine," John Adams wrote to a friend after Paine's death in 1809, "for such a mongrel between Pigg and Puppy, begotten by a wild Boar on a Bitch Wolf, never before in any Age of the World was suffered by the Poltroonery of mankind, to run through such a career of mischief. Call it then the Age of Paine."

It's odd that so spectacular a force of media and political nature should be so vaguely remembered. Unfortunately for Paine, the historian Crane Brinton reminds us, revolutionaries need to die young or turn 214►



◂ 213 conservative in order not to lose favor with society. Paine did neither and fell from grace. Many of his reform programs will remain unacceptable to political conservatives and his religious views will always offend believing Christians. Though his memory is invoked from time to time, his resurrection will never be complete.

At the moment, though, he is showing signs of minor resurgence. In 1994, officials in Washington, DC, were considering funding a monument to him somewhere. And Sir Richard Attenborough, the famed British actor and director, has been struggling for several years to get studio backing for a film about Paine.

A Paine bio – featuring two bloody revolutions, standoffs with Napoleon, tangles with the British royals, and cameo roles for Washington, Jefferson, Robespierre, and his nemesis George III – would make a socko TV miniseries, too.

Nigel Hawthorne could play Paine's father, who intercepted his runaway teenage son in 1756 as he was about to board the *Terrible*, a privateer captained by a man named William Death. Heeding his father's desperate plea, Paine didn't sail. Shortly afterward, the *Terrible* was engaged by a French privateer, the *Vengeance*, and was horribly mauled. More than 150 members of its crew were killed, including Captain Death and all but one of his officers.

Anthony Hopkins could star in *Rights of Man*, playing the role of the Honourable Spencer Perceval, who stood up at the Guildhall in London to read out the sedition charges against the absent Paine in 1792 and accuse him of being "wicked, malicious, and ill-disposed."

And imagine the scene of his near-execution. Paine went to France after the Revolutionary War as a hero and supporter of democratization there. But the French Revolution was far bloodier and more violent than the American. Paine tried to save King Louis XVI's life and pleaded with the country's new rulers to be merciful and democratic. Eventually, he was imprisoned and sentenced to death. In June 1794, six months into his harrowing imprisonment, watching as hundreds of fellow prisoners were led off to be killed, Paine fell into a feverish semiconsciousness. His fellow cellmates barely kept him alive, mopping his brow, feeding him soup, and changing his clothes.

The prison governors were ordered to send him to the guillotine the next morning. At 6 a.m., a turnkey carrying Paine's death warrant walked quietly down the prison corridors, chalking the cell doors of the condemned, marking the number 4 on the inside of Paine's door. Usually the turnkey marked the outside of the door, but Paine was seriously ill, and his cellmates had been granted permission to leave the door open so that a breeze could help cool Paine's profusely sweating body.

That evening, the weather cooled, and Paine's cellmates asked a different turnkey for permission to close the door. Knowing that the number on the door was now inward, the occupants of the cell waited, Paine murmuring on his cot. Near midnight, the death squad slowly made its way down the corridor, keys jangling, pistols drawn. One of his friends cupped his hand over Paine's mouth. The squad paused, then moved on to the next cell.

A few days later, the Jacobin government was overthrown. A fellow prisoner said Paine had struggled to keep his democratic values alive in prison. "He was the confidant of the unhappy, the counselor of the perplexed; and to his sympathizing friendship many a devoted victim in the hour of death confided the last cares of humanity; and the last wishes of tenderness."

Despite his close call, Paine stayed in France until 1802 when he managed, inevitably, to alienate Napoleon. At the invitation of Jefferson, he returned to the United States to a hostile welcome.

Although he had left the United States a revolutionary hero, Paine soon outraged the American clergy by publishing *The Age of Reason*. He infuriated the business community with his pro-labor writings in England and by publishing *Agrarian Justice*. He also wandered into the middle of increasingly vicious domestic politics. Federalists, looking for ground to attack Jefferson, seized upon his invitation to Paine to come home. Paine was savaged as a heretic, and as an unwashed, drunken infidel. He was attacked in columns and stories, insulted on the streets and in public places. Not only had the children forgotten the father, they had turned on him.

Paine didn't see, writes Keane, "that he was among the first modern public figures to suffer firsthand an increasingly concentrated press equipped with the power to peddle one-sided interpretations of the world."

Perhaps, if a movie is made and Paine becomes a focus of attention once more, somebody could locate his bones. That they are missing may be the most fitting postscript to his life. British journalist and Paine contemporary William Cobbett smarted at the way Paine had been neglected in his final years. Cobbett wrote, in his *Cobbett's Weekly Political Register*, under the pseudonym of Peter Porcupine: "Paine lies in a little hole under the grass and weeds of an obscure farm in America. There, however, he shall not lie, unnoticed, much longer. He belongs to England."

Just before dawn one autumn night in 1819, Cobbett, his son, and a friend went to Paine's New Rochelle farm – the hole under the grass is still there, marked by a plaque from the Thomas Paine National Historical Association – and dug up his grave, determined that Paine should have a proper burial in his native country.

It's easy to imagine citizen Paine in the new culture, issuing fervent harangues from *http://www.commonsense.com*. He would be a cyber hell raiser, a net.fiend.

From there, the story becomes hazy. By most accounts, Cobbett fled with Paine's bones but never publicly buried the remains. Some historians think he lost them overboard on the return voyage. But certain British newspapers report their being displayed in November 1819, in Liverpool.

After Cobbett's death in 1835, his son auctioned off all his worldly goods, but the auctioneer refused to include the box that supposedly contained Paine's bones. Years later, a Unitarian minister in England claimed to own Paine's skull and right hand (though he wouldn't show them to anybody). Parts of Paine, truly by now the "universal citizen" he wanted to be, have been reported turning up intermittently ever since. In the 1930s, a woman in Brighton claimed to own what clearly would be the best part of Paine to have – his jawbone. As historian Moncure Daniel Conway wrote a hundred years ago: "As to his bones, no man knows the place of their rest to this day. His principles rest not." ■ ■ ■

◂ 167 Waitt's own office is modern, all done up in black and white (the cow motif again), with rock music playing in the background. He's 32, tall and lean, and the bony look of his face is accentuated by the way he wears his hair, pulled back tight in a thin ponytail. He's tense and driven – but he tries to be polite about it. As he waits for me to ask him questions, I sense him checking his restlessness with great effort.

I ask how he started out. As I understand the story, he was capitalized by his father's cattle-ranching fortune.

"Not true," says Waitt. "His business ran into trouble. I was 18 years old, and he told me he didn't want me to go into cattle, and he'd support me emotionally, but not financially. Texas Instruments had been trying to market its professional computer. It was better than IBM but" – he grins – "they forgot about that *compatibility thing*. So when TI discontinued the product, the users ended up abandoned – they felt like orphans – and there were companies selling accessories and software to them at extortionate prices. So my brother and I started a user group with collective muscle to force the prices down."

He sits back in his chair, reminiscing for just a second. "There are still some people out there who used to sell that overpriced hardware and don't like me a whole lot." He says it with a happy smile.

Waitt recalls that he came up with the name "Gateway" because in the mid-1980s, setting up micro-to-mainframe "gateways" seemed like the key to the industry. Someone he was drinking with in a bar suggested adding "2000" to the name, and it sounded good, so he went along with that. Then he started selling PC compatibles, and Gateway's gross revenue grew by a factor of eight in the first year, and it grew six times more in the second year.

I ask him how he managed to finance that kind of expansion.

"We did our typical business plan," he says. "Went out to bankers and said, Hi, here we are, we want money. We were extremely naïve. The bankers said, Do you have any collateral? And we said, Nope. In the end we used a CD (certificate of deposit) of my grandmother's as collateral: $10,000. But I could never count on banks for financing, and we haven't borrowed in a long time, except when the state of South Dakota offered us a loan at 3 percent, which you'd have to be crazy to turn down. We now have the lowest debt-to-equity ratio in the industry, and we have more than $100 million in cash. And we don't owe anybody money."

Waitt's brother seems to have been the one with the technical knowledge initially, but he's no longer actively involved. "He's having a good time managing his investments," says Waitt. "He's still a large stockholder."

So how did he mastermind the growth? Why didn't Gateway languish like a hundred other clone manufacturers?

"Focus," he says. "Concentrating on what we're good at. It's not a matter of being first, it's being there at the right time, being first in *volume* to market, and knowing what trends to stay away from."

Well, OK, but I'm sure his competitors would say much the same thing. If there is a Gateway success formula, he hasn't really told me what it is.

I try another line. What makes Waitt keep on fighting the fight? He could retire at this point and live comfortably without ever working again.

This question seems to catch him off-guard. Until this point, he's been talking in a rapid, staccato rhythm as he alternately sprawls and fidgets on his leather chair, with the radio playing oldies such as "Beat the Reaper" in the background.

He pauses. "What keeps me motivated," he says thoughtfully, "the thing that keeps me going is – the fact we have really only scratched the surface of what we can accomplish." Now he sounds certain again, defining new goals and his ambition to achieve them. "Getting to where we are has been the easy part," he says. "Taking it to the next level is the real challenge, over the next five years. I'm only 32 years old; I'm not intending to go out to pasture just yet." He grins. "No pun intended."

And his objective for Gateway 2000 as a corporation?

Once again, the question makes him pause. "It's one of those things you don't really know until you get there," Waitt says finally. "But – there's no point in aiming to be Number Two. You've got to have a plan-to-win attitude. This whole business is in its adolescence. Right now, we're just like a 14-year-old kid who stole the keys from Mom and Dad so he could go do some really crazy stuff." He laughs, enjoying the image. "There are all kinds of challenges still ahead."

I've spent the whole day in the Gateway complex, talking to people at every level and walking maybe 5 miles along the industrial-carpeted corridors. But I still feel there's something missing, something that hasn't been said. And so, at quitting time, I head back to Jim's I-29 Liquor & Lounge, because I've been told that this is the main after-hours Gateway hangout.

Here I meet a gruff but amiable, heavy-drinking, bearded electronics engineer named Scotty who was one of the original Gateway employees and is the type of computer geek who holds rather firm opinions on just about everything. When I ask him the secret of Gateway's success, he doesn't have to think twice about it. "We wanted to prove," he says, "that out here in South Dakota, we could do what big corporations like IBM had done – and do it better, selling a well-manufactured product at a more reasonable price, with less bullshit." He folds his arms and gives me a steady, deeply serious look. "You have to understand the mentality here in the Midwest. We *care*. We really do."

Sitting beside Scotty is his distractingly pretty wife, Kelly, who is fluent in four different programming languages. She tells me that she used to hang out at Gateway and do tech support, even though she's never been an employee. "I went there for fun," she says. "People worked all kinds of hours, just because they believed in it. For many of them, it was an obsession." She pauses. "But it's not quite like that anymore."

Scotty nods emphatically. "There are people, now, who don't work hard enough." He says it with an air of righteous disapproval. "And it's getting more corporate."

Corporate? I guess he means relative to the days when the business operated out of a barn. But in the near future, as Gateway continues to make the transition from being one man's obsession to a multinational corporation challenging Compaq and IBM for market dominance, Scotty's perception may be increasingly accurate.

As the company grows bigger, it must surely acquire more levels of management and a more corporate style. In so doing, it will move further from the success formula that has worked so well. Will Ted Waitt's cows still permeate every level of his empire? Will employees see beyond an amorphous corporate entity and continue to relate personally to their quirky CEO? Once Gateway is more industry giant than cattle ranch, can its minions continue to feel part of a small community out in the boondocks, proving itself against the big boys?

To paraphrase Waitt, the real challenge for Gateway lies ahead – but not just in terms of sales. The toughest task facing Gateway will be merely to sustain what has already been achieved, as if by accident, out here in the flatlands of South Dakota. ■ ■ ■

◂ 172 this other-worldliness, that distances you a little bit from the darkness, but still allows you to be dark."

Nonetheless, the staff of six writers has frequently fought with the Paramount standards-and-practices people. "On the whole, they've been good about letting us do what we want to do, but in the beginning, we were less than comfortable with one another," says Osborn of the studio's censors. Initially, the writers got notes suggesting that the studio wanted more upbeat family scenes and more happy endings.

Then they were asked to wash out their pens with soap and water.

"The worst thing they ever did was lift a word from the soundtrack of the first show without telling us," says Reno, still a little incredulous. "We didn't discover it until the première party. They didn't even bleep it, which could have been funny in itself. You just see this character moving his lips and for a moment, there's no sound." What was the offending word? "Scumbag. We weren't aware of any connotation beyond lowlife or jerk. But the standards-and-practices people insisted that it meant *used condom*."

A little while later, a tiff ensued over the word *scrotum*. "I thought it was the clinical term, the acceptable way of saying balls," muses Reno. "On *The Wonder Years*, one brother calls the other 'scrote' all the time. You hear worse words than that on *NYPD Blue* and *Hill Street Blues*. We were a little dumbfounded at the vehemence that *scrotum* elicited at Paramount. In the end, we got it in. We're fans of the old Lenny Bruce philosophy that words are a good thing to be exposed to."

Even so, Osborn says the writing team is mindful of children who may watch the show despite the late hour. "Animation by its nature will attract a younger audience," he believes. He and Reno have decided not to show blood, and they have occasionally altered words or situations that could be considered inappropriate for kids. "One of the things we changed about Duckman was his chain-smoking," says Osborn. "I originally thought, He should chain-smoke, it fits. But children cannot necessarily process the notion that it's an unhealthy thing. They may think that it's cool. To see an animated character smoke might easily be viewed as a tacit acceptance."

But Reno is not so sure. "Of course, the contradiction there is that we also want kids to process that things like anger and sexism are wrong, even though Duckman has a lot of *that*. So there are a few inherent problems with deciding that you're going to send one message, but not another."

Avery, Disney, Groening

Everett Peck has a shy smile and soft brown eyes that seem strangely at odds with his almost Mansonesque features. There is an unusual boyishness about him for a man in his mid-40s. It's easy to mentally peel off the years, to picture Peck as the underachiever he was in high school, exasperating his teachers by dreamily doodling in school books, his head too full of Tex Avery and Walt Disney to leave much room for math or conjugating verbs. Not until he went to art school did Peck realize that the distraction that had kept him from a satisfying academic performance was perhaps a blessing in disguise. Maybe he had more than just an inconvenient urge to draw; perhaps he had *talent*. "It was like, Wait! I can get credit for this? Cool!" he remembers with a grin.

Choosing a duck as the antihero was a tip o' the hat to all the greats that came before him, from Donald to Daffy to Howard.

For more than 20 years, Peck has been a freelance illustrator, with credits that include *Rolling Stone*, *Esquire*, *Playboy*, and *The New York Times Magazine*. He has never before worked on a major cartoon show, let alone one he created, and he admits to getting a little starry-eyed when he drives past the huge *Duckman* billboard on San Vicente and Wilshire, in downtown LA. "He's up there, larger than life, as well as on millions of TV screens. That's pretty unbelievable," says Peck. "And the most gratifying thing is, it's still close to me. Duckman is still intact after the whole process."

He'll allow that the roughness of the original comic book has been substituted for a more sophisticated, streamlined look. "Yeah, we made him more refined, but simpler. Still, that's inconsequential. It doesn't change his character. The goal was to make him more user-friendly, I guess, so that the 300 animators in Korea, where the animation cells are put together, would have an easier time drawing him."

Choosing a duck as his antihero, explains Peck, was a tip o' the hat to "all the great ducks that came before him, from Donald to Daffy to Howard. Plus, ducks are pretty funny, because of their profile."

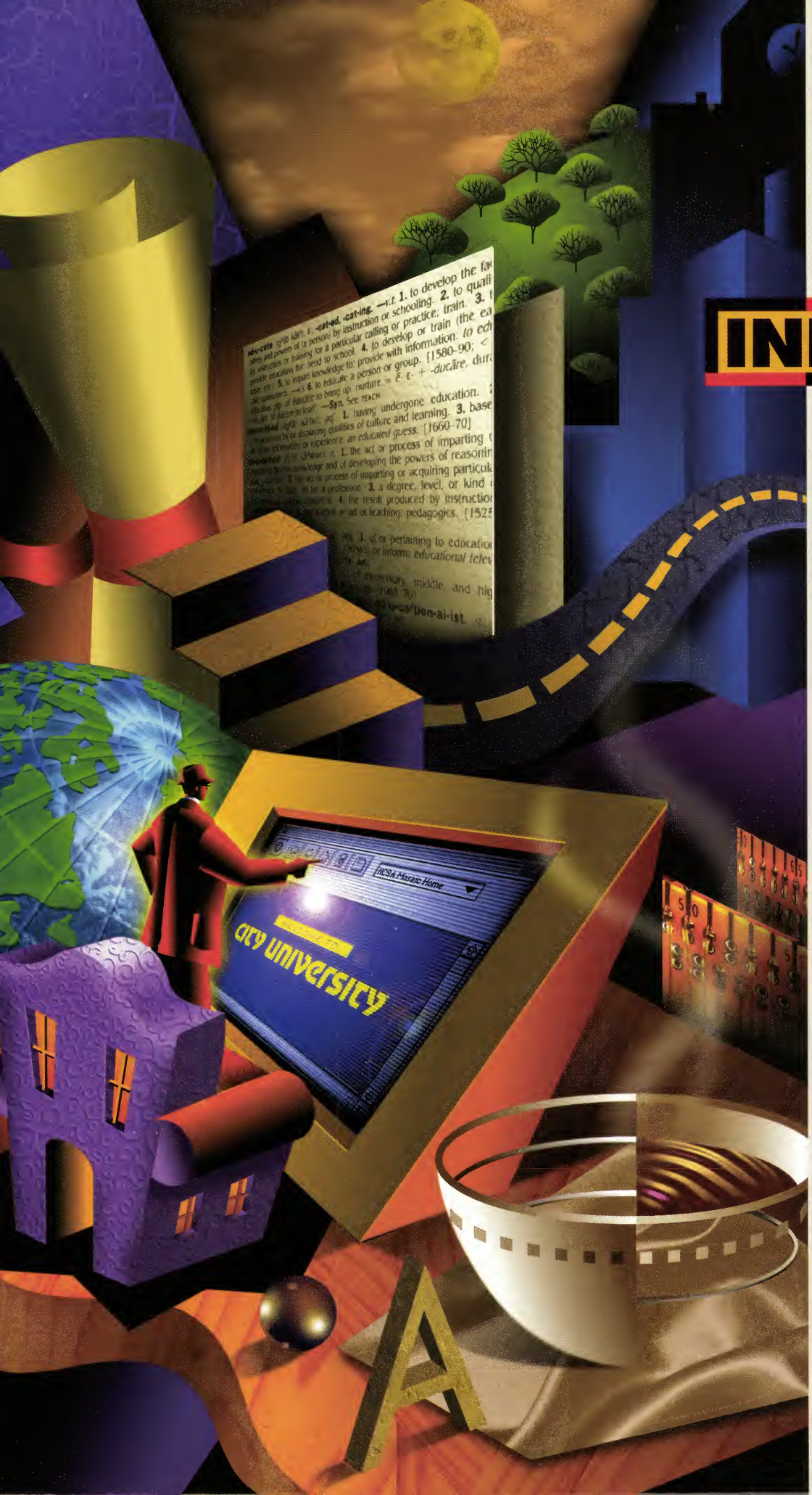
Peck believes it would never have come to a *Duckman* TV series, had it not been for two things that changed the stature of animation in the '80s and '90s: *Who Framed Roger Rabbit* and *The Simpsons*. "They opened the door for *Ren & Stimpy* and *Beavis and Butthead* and *Duckman*. There's tremendous potential for new shows and new directions in animation right now, although I'm afraid that we could lose the opportunity if a lot of bland shows were to hit the air and fail, like *The Fish Police* and *Capital Critters*. The reason that *Ren & Stimpy* and *Duckman* have succeeded is that these shows are based on an individual artist's vision. Something like *The Fish Police* seemed more of a group decision by a studio, not really propelled by one person's imagination."

Reno and Osborn are equally quick to acknowledge their debt to *The Simpsons* and its creator, Matt Groening. "That show, to us, is still as well written as anyone could hope for. It's kind of a beacon. I don't know if we would have seen *Duckman*'s potential if *The Simpsons* didn't exist and if we hadn't known that it was possible to get to that level."

Another – less obvious – influence on *Duckman* is *Monty Python's Flying Circus*, "because they liked to mix the silly with the intellectual," explains Osborn. "*Monty Python* could go from discussing Byron to hitting someone over the head with a rubber chicken. That juxtaposition was always something that appealed to both of us. We do everything from fart jokes to takeoffs on *Who's Afraid of Virginia Woolf?*"

But so do the people who write *The Simpsons*. "Yeah. But we're different," maintains Osborn. "I hesitate to say that *The Simpsons* have a sweeter voice, because that show is so acerbic. But what fuels Homer is that he usually chooses to travel the path of least resistance, while Duckman tends to forge ahead blindly, creating accidents all around him as he goes."

Perhaps Peck sums up the distinction best. "*The Simpsons* could almost be live-action. I want to be able to take *Duckman* further and stretch the boundaries of animation. Be extreme." He pauses, then smiles sweetly. "Like, maybe, one day, I could blow up his head or something."



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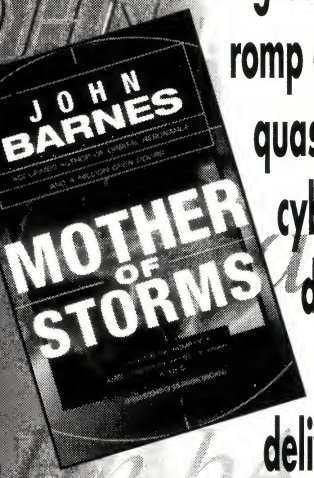

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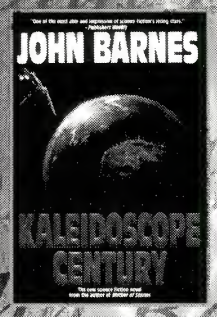

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Radio

◄ 177 harnessed to help make the future better than the past.

"Will Radio Make the People the Government?" demanded a headline in a 1924 issue of *Radio Broadcast*. Political columnist Mark Sullivan was reluctant to answer the question definitively, but he had little doubt that the confluence of radio and politics was destined to profoundly impact on American democracy. "The fundamental merit of the radio in Congress will be that it will enable the public to get its information direct," Sullivan prophesied in proto-Gingrichian tones. "At present, aside from those speeches from men who, because of one distinction or another, have all their speeches printed in full – aside from these, the public is now dependent on the vicarious censorship of the newspaper reporter. It is the reporter who ignores some speeches, makes mere allusions to some, and transmits extracts from others. In all this exercise of judgment and taste, there are the aberrations that inevitably accompany any individual judgment." But radio would change all that. "The person who wants to listen to Congress will be able to do so, and there will be many who will want to listen."

For the thousands of amateurs, the ether crackled to life as a two-way communications medium.

Others speculated that radio would put politics on a more rational footing and bring civility back into the campaign process. "There is no doubt whatever that radio broadcasting will tend to improve the caliber of speeches delivered at the average political meeting," a *Radio Broadcast* editor wrote in his monthly column. "Personality will count for nothing as far as the radio audience is concerned. Ill-built sentences expressing weak ideas cannot succeed without the aid of forensic gesticulation. The flowery nonsense and wild rhetorical excursions of the soap box spellbinder are probably a thing of the past if a microphone is being used. The radio listener, curled comfortably in his favorite chair is likely to criticize the vituperations of the vote pleader quite severely. Woe be unto the candidate who depends for public favor upon wild rantings and tearings of hair."

Politics would not be alone in feeling the impact of radio's growing reach. Religion, too, was destined for dramatic transformation. On January 2, 1921, the Reverend Edwin J. Van Etten of the Calvary Episcopal Church on Shady Avenue in Pittsburgh became the first minister in the United States to broadcast a church service by wireless radio. (The pilot broadcast went without a hitch, with the help of two wireless engineers – one Jewish and one Catholic – who spent the duration of the service camouflaged in choir robes.) Response to the experiment was strong, and in subsequent months, donations from the Calvary Church's "Unseen Congregation" flowed in steadily. But as more and more churches took to the airwaves, Van Etten developed a strangely Darwinistic view of the trend he had unleashed.

"Broadcasting of church services will prove something of a disintegrating force on the church organizations," he warned in a 1923 issue of *Radio Broadcast*. "Only the fittest preachers will survive, and struggling churches will, more or less, go to the wall."

Apparently, such fears were shared by Van Etten's superiors. A few months later, Episcopal Bishop Stearly wrote a letter to *Radio Broadcast* asking, "Why go to your parish church when you can sit at ease in your parlor and hear the heavenly music of a capable choir and be charmed by the fervid eloquence of a magnetic preacher? There seems to have entered into our crowded and throbbing life another ally of those forces which make difficult the assembling of the faithful for praise and prayer.... Now it becomes necessary for the clergy to make the church more attractive than the world's entertainments, to discover to men the possibilities within it for strength and refreshment, and the gifts of grace in its bestowings, more precious than earthly things."

The future of radio was so bright even the sacred aura of the Almighty looked faded by comparison.

Nevertheless, the editors of *Radio Broadcast* had their own demons to contend with. All of a sudden, radio broadcasting had become wildly popular. Everyone was taking to the airwaves – broadcasters and listeners alike. In early 1921, only five stations had received the new "broadcast class" licenses that were being issued by the Department of Commerce for transmissions of "market or weather reports, and music, concerts, lectures, etc." By early 1923, that number had shot up to 576.

Meanwhile, as radio receivers got easier to use and broadcast programming more interesting, hundreds of thousands of Americans started tuning in for the first time. Hardware practically flew off dealers' shelves as sales of radio receivers jumped sixfold, from $60 million in 1922 to $358 million in 1924.

As more and more listeners began hearing an ever-growing variety of radio broadcasts, programming tastes became increasingly sophisticated. Newcomers didn't want to hear radio geeks chatting among themselves in Morse code. Like newbies on America Online, they wanted their information to arrive in neatly wrapped packages. They wanted to hear professional-quality programs broadcast with professional-quality transmitting equipment. They wanted to be entertained and informed. That meant live music. And speeches. Sporting events. News and weather reports. And they wanted it all to come in crystal clear, with little static or interference.

The sudden popularity put the squeeze on broadcasters, because meeting the expectations of this growing audience was an expensive proposition. Not only did it cost anywhere from $3,000 to $50,000 and up to build and equip a broadcast station, but there were plenty of operating costs to account for even after the station was up and running – staff salaries, equipment maintenance, compensation for musicians and performers. All these costs were borne by broadcast station owners, while broadcast listeners paid nothing at all for the programming they received and enjoyed. And nobody had yet figured out an acceptable way to recover all that station investment, as the idea of "direct advertising" remained beyond the pale of public tolerance. It was a problem many impoverished Web site administrators should appreciate.

Radio broadcasting was an expensive proposition, yet few station owners were prepared to bear these costs indefinitely. The 576 radio broadcast stations operating in 1923 were run by an eclectic assortment of business people, starry-eyed idealists, public-service organizations, and hard-core wireless addicts. Few regarded radio broadcasting as a profit-making venture unto itself – most broadcast stations were created to serve as high-tech promotional gimmicks that would draw attention to the station owners' primary line of business. Thus in Philadelphia, Gimbel's Brothers department store operated station WIF. Retailer L. Bamberger & Co. founded WOR in New York. WAAF in Chicago was run by the Union Stock Yards & Transit Co. In New Lebanon, Ohio, the Nushawg Poultry Farm owned station WPG. And in Los Angeles, the City Dye Works and Laundry Co. started station KUS.

The broadcast landscape of the early 1920s might have seemed pretty familiar to us if somebody had tacked a suffix of -.com, -.edu, -.gov, or -.org onto the call letters of each radio station. In 1923, for example, 39 percent of radio broadcast stations were owned by companies that manufactured or sold radio hardware and equipment. An assortment of retail stores and commercial businesses owned another 14 percent. Thirteen percent was owned by educational institutions such as schools and universities. Twelve percent was owned by newspapers or publishing houses. Churches and YMCAs owned 2 percent. Municipalities and publicly regulated utilities each owned 1 percent. And the rest were operated by a motley collection of "others," whose ranks included everyone from ranchers and Boy Scouts to eccentric millionaires and backyard amateurs.

A single question appears over and over: Who will pay for radio broadcasting?

Unfortunately, nobody had yet figured out a way to make money from radio broadcasting. And until that happened, the "wireless craze" could be dismissed as just another pop-culture fad. Industry experts argued that wireless wouldn't end up in every American home until broadcast quality was improved on a nationwide basis, but such obvious conclusions didn't help much when it came time to figure out a way to finance all this mass media infrastructure development. Thus a single question appears over and over on the pages of *Radio Broadcast* magazine throughout the first half of the 1920s: Who will pay for radio broadcasting?

There were plenty of ideas floating around. In 1922, *Radio Broadcast* proposed that since the airwaves were a public treasure, it was only natural that each radio station should seek out a "public spirited citizen" – preferably one with very deep pockets – to act as a patron. "We have gymnasiums, athletic fields, libraries, museums, etc. endowed and for what purpose? Evidently for the amusement and education of the public. But it may be 220 ►

BITS AND BYTES IN THE HEARTLAND

◄ 219 that in the early future the cheapest and most efficient way of dispensing amusement and education may be by radiophone," the magazine suggested.

Two years later, the editors of *Radio Broadcast* thought they had their sugar daddy. An assortment of Wall Street financiers – gentlemen "who could not possibly be suspected of any idea of profit-taking, and who have been intimately connected with other musical ventures" – announced that they planned to form a nonprofit group called the Radio Music Fund Committee to "solicit funds from the listening public, calling for contributions of a dollar up, from all those who are entertained." The funds received would then be "directly applied to the securing of artists of the highest caliber."

A similar plan was tested at WHB, a station owned by the Sweeny Auto School in Kansas City. After issuing a statement pleading that "it is only fair for those sharing the pleasure to pay a portion of the expense," WHB's station head managed to pry $3,100 from his "invisible audience." Such results were encouraging, but encouragement and $3,100 wouldn't cover all the bills. "Of course that amount won't go far towards keeping a broadcast station running," *Radio Broadcast* admitted, "But the audience is indeed showing an appreciative spirit."

There were other suggestions. Broadcast programming could be delivered as a public utility to American homes through wired networks, much like electricity or telephone service. Shortwave transmitters could be pressed into action, since the greater range of shortwave broadcasts would eliminate the need to operate so many local stations. David Sarnoff, vice president and general manager of RCA, volunteered that leading equipment manufacturers would be happy to aid the cause by tacking a broadcast surcharge onto the cost of radio hardware. And in New York, an experiment in municipal financing was launched in 1924 with the founding of radio station WNYC.

Finally, in 1925, Radio Broadcast announced that after having reviewed roughly a thousand entries, a winner had been chosen in the magazine's first-ever, "Who Is to Pay for Broadcasting and How?" essay contest. The $500 first prize was awarded to H. D. Kellogg Jr. of Haverford, Pennsylvania, for his suggestion that the federal government collect a sales tax of $2 per amplifier tube and 50¢ per radio crystal sold. The amassed tax revenues would then be distributed to broadcast stations nationwide by a new bureaucracy, the Federal Bureau of Broadcasting. The plan seemed comprehensive, but was coolly received by many analysts. Professor J.H. Morecroft, a former president of the Institute of Radio Engineers, wrote, "I do not see how a fund collected from the taxing measure can be equitably distributed. I dislike the idea of Government getting into the game because of its well-known and frequently proved inefficiency and blighting effect in attempting to carry out technical expertise. Let us keep broadcasting as far as possible out of Government hands." Sound familiar?

Herbert Hoover shared this free market bias, and his critique of the *Radio Broadcast* plan made that perfectly clear. In 1922, the English had launched a centralized system of hardware taxation on behalf of a new radio trust called the British Broadcasting Company, or BBC. Hoover wasn't about to let the same thing happen in the United States. "I do not believe that your prize-winning plan is feasible under conditions as they exist in this country, however well it may work elsewhere," he huffed.

There may have been as many different proposals about how to pay for broadcasting as there were frequencies on the radio dial, but everyone seemed to agree on two things: federal management wasn't an option, and selling air time to advertisers was absolutely out of the question.

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"I believe that the quickest way to kill broadcasting would be to use it for direct advertising," Secretary Hoover argued in 1924. "The reader of the newspaper has an option whether he will read an ad or not, but if a speech by the President is to be used as the meat in a sandwich of two patent medicine advertisements, then there will be no radio left."

Hoover uttered these words during his opening address at the Third Annual Radio Conference – a meeting of radio executives and government technocrats held in Washington, DC, to chart the future of the broadcast industry. Two years earlier, during the 1922 conference, Hoover had been heard making similarly negative comments about the evils of "ether advertising."

"It is inconceivable that we should allow so great an opportunity for service to be drowned in advertising chatter," he had said.

After Herbert Hoover sketched out his ideal of commercial-free broadcasting at the first Washington radio conference, *Radio Broadcast* reported that several bigwigs from American Telephone and Telegraph had "agreed with this point of view." But back in Manhattan, a group of AT&T colleagues were busy working on a project that would soon lead to the near-total commercialization of the broadcast airwaves. It was to be the "killer app" of the radio broadcast industry – an innovation that would, in a single stroke, solve the "who is going to pay" riddle and create a mechanism for financing the production of audience-attracting radio shows. It was a new programming format that would suburbanize the wireless frontier. But nobody realized that at the time. Not Herbert Hoover. Not the editors of *Radio Broadcast*. Not the amateurs. Not even the guys at AT&T. Nobody knew that big change was afoot.

It was all taking place out in the open – right under everybody's nose. Two weeks before the start of the 1922 radio conference, AT&T issued a press release announcing that the nation's premier telecommunications company planned to inaugurate a brand-new wireless service. It was going to be called "toll broadcasting."

"The American Telephone and Telegraph Company will provide no program of its own, but provide the channels through which anyone with whom it makes a contract can send out their own programs," the press release explained. "Just as the company leases its long-distance wire facilities for the use of newspapers, banks and other concerns, so it will lease its radio telephone facilities and will not provide the matter which is sent out from this station."

It sure sounded innocent enough. AT&T simply planned to build a giant pay phone. Toll broadcasting would work like a radio phone booth in which anyone with something to say or a song to sing could walk in, stand before the microphone, and get the word out to thousands of fellow citizens. One-to-one communication would give way to one-to-many, but the basic pay-phone idea would remain the same. You plunk down your money, and you speak your piece. Pay as you play. The phone company would merely rent you some hardware – in the form of radio station WEAF. And instead of needing pocket change, you'd have to bring along some pretty big bills to use this new phone booth. Rates started at $40 for a 15-minute period in the afternoon, or $50 in the evening.

"It is inconceivable that we should allow so great an opportunity for service to be drowned in advertising chatter."

It took a few months for the idea to catch on, but toll broadcasting was a hit. At 5:15 in the afternoon on August 28, 1922, WEAF sent out its first commercial message. The groundbreaking broadcast came in the form of an infomercial by the Queensboro Corporation, a New York development company that sought to educate the listening audience about American novelist Nathaniel Hawthorne – and perhaps unload a few units in the company's new "Hawthorne Court" apartment complex over in Jackson Heights, Queens, at the same time.

"I wish to thank those within the sound of my voice for the broadcasting opportunity afforded to me to urge this vast radio audience to seek the recreation and the daily comfort of a home far removed from the congested part of the city, right at the boundaries of God's great outdoors, and within a few minutes by subway from the business section of Manhattan," began Mr. Blackwell from the Queensboro Corporation. "This sort of residential environment strongly influenced Hawthorne, America's greatest writer of fiction. He analyzed with charming keenness the social spirit of those who had thus happily selected their homes, and he painted the people inhabiting those homes with good-natured relish." (Apparently, Hawthorne 222►

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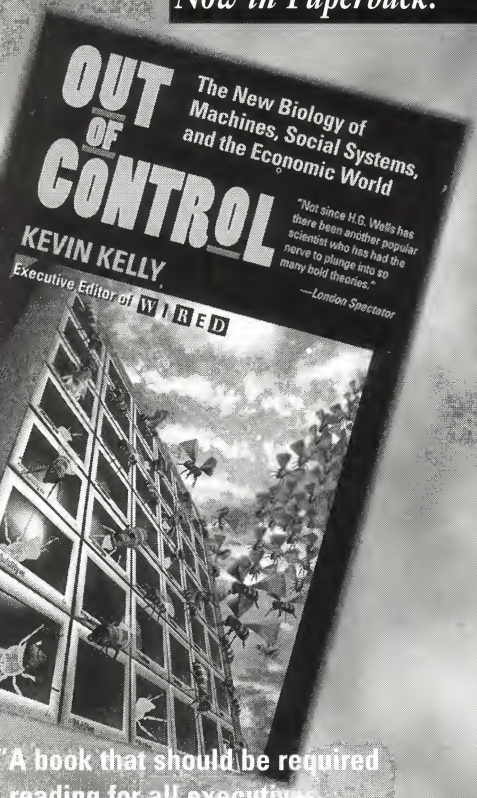

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Radio

◂221 Court survives to this day as an urban oasis. According to Harold Thompson, president of the Hawthorne Court Council, life at the complex "just keeps getting better." "This is a wonderful place to live!" he gushed during a phone interview.)

Similar programs by Tidewater Oil and the American Express Company followed a month later. Straight-ahead advertising was still considered a no-no, but sponsorship seemed to be OK. Other companies began signing up as sponsors for professional entertainment. The "Happiness Boys" was a name given to Billy Jones and Ernie Hare – two vaudeville comedians whose weekly show was sponsored by the Happiness Candy Company. (Jones and Hare would also be heard under the guises of the "Best Foods Boys" and the "Taystee Loafers.") Clicquot Ginger Ale brought us music by the "Clicquot Club Eskimos." "The Eveready Hour" was a slick variety show that received production help from the N.W. Ayer advertising agency.

It may have been commercial, but it was also reasonably subtle, and audiences ate it up. And as they did, the money began rolling in. AT&T realized that it could offer toll broadcasters access to an even larger listening audience (not to mention some impressive production economies of scale) by linking a few radio stations together with phone wires. AT&T called this innovation "chain broadcasting," and it was first tried successfully in the summer of 1923, when programming that originated from WEAF in New York was simultaneously broadcast by WJAR in Providence, Rhode Island, and WMAF in South Dartmouth, Massachusetts. It was the first broadcast network.

RCA, Westinghouse, and General Electric figured out that there was big money to be made in network broadcasting, and in September 1926, they teamed up to start a network of their own. They called their new company the National Broadcasting Corporation. NBC then made AT&T an offer for WEAF. AT&T was beginning to get cold feet in the uncharted waters of programming distribution, so the phone company decided to unload the golden goose. NBC's offer to pay $1 million for WEAF was accepted. WEAF was renamed WNBC and became the flagship station of the new network. NBC prospered and in 1927 spawned a competitor – the Columbia Broadcasting System. And by 1930, when radio had become a fixture in almost 46 percent of American homes, the commercial networks dominated the broadcast airwaves and little remained of the amateurs or the wireless community they had so proudly created.

So where does that leave us?

It leaves us at the beginning.

According to Odyssey Ventures Inc. of San Francisco, only 7 percent of American households currently have access to any online media. We still don't know who's going to pay for a nationwide system of high-bandwidth pipes – never mind the question of how this new media will evolve as those household penetration numbers climb ... ever higher ... into double digits. Right now, we are present at the creation of yet another great system whose worth will depend on the use we make of it.

Radio was an interactive medium during its early days. It was cherished by people much like ourselves. But later it changed. The interactivity was lost. Radio junkies had fewer opportunities to create broadcast programming. Passivity became the norm.

Maybe things will be different this time. Online media enables us to be both consumers and suppliers of electronic media content. Today, we have a second chance to "develop the material that is transmitted into that which is really worthwhile," as Hoover put it in 1924. Perhaps radio wasn't the right technology. But the Web and the Net may well be. Our job is to make sure that glorious potential doesn't get stuffed into yet another tired, old media box. ■ ■ ■

To learn more about the early history of radio broadcasting, check out some of the books that helped make this article possible:

Banning, William Peck,
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Harvard University Press, 1946

Barnouw, Eric,
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Smulyan, Susan,
Selling Radio: The Commercialization of American Broadcasting 1920-1934,
Smithsonian Institution Press, 1994.

Sterling, Christopher H. and Kittross, John M.,
Stay Tuned: A Concise History of American Broadcasting,
Wadsworth Publishing Company, 1978.

Colophon

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Drugs of choice: Atomic Fireballs, spirulina (via Odwalla Super Food drink), Thera-flu, Chuck's fresh-baked cookies.

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Message 23:
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From: <nicholas@media.mit.edu>
To: <lr@wired.com>
Subject:

A Bill of Writes

Dear Newt,

Your support of the digital age is deeply appreciated. As we move from a world of atoms to one of bits, we need leaders like you explaining that this revolution is a big one, maybe a 10.5 on the Richter scale of social change. Alvin and Heidi Toffler are dandy advisors; good for you for listening to them! The global information infrastructure needs a great deal of bipartisan cooperation, if only to help (read: force) other nations to deregulate and privatize their telecommunications. As you reach out across the world to evangelize the information age, people will listen.

However, there is something specific you could do for the digital revolution in your own congressional backyard, a few hundred feet from the Capitol building – perhaps something that has never been considered.

The Library of Congress is a giant dumpster full of atoms. Books check in but they almost never check out. A Bill of Writes would change that.

Congress controls the world's largest library – it receives more than 30,000 items per day. Of these, perhaps 8,000 are saved. The Library of Congress is, quite frankly, out of shelf space – even if one includes the overflow cave it shares with Harvard University.

The library, your library, is a giant dumpster full of atoms. Books and other materials check in but almost never check out. But a wonderful largesse inspires this library: to read a book, one need not possess a special Library of Congress card, nor be a citizen of the United States. A person needs only to possess the desire to read. Well, actually, the individual has to be in Washington, DC, must be over 18 years old, and the librarians need to be able to find the thing requested. If misshelved, it might as well be lost forever.

Few people ever use the library because, in reality, almost no one can. The library is almost everything but usable, everything *but* digital. There are more than 100 million items, and virtually none are available in digital form. Recently, the library stuck its toe out onto the Internet, touching millions through exhibits on the World Wide Web. Indeed, last summer it received its first-ever digital books (never mind that no procedures exist for receiving those bits, and essentially no apparatus exists to deal with them).

As you know, almost every book published in the United States during the last 15 years has been produced digitally. Your next book will be, too, but I bet the atoms will still pile up in the depository – not the bits. This problem has not gone unnoticed. The National Science Foundation, the Advanced Research Projects Agency, and the Library of Congress are fully aware of the challenge to change those atoms into bits. The government has committed more than US$30 million over four years on digital-library research, including new means to convert, index, and navigate the wealth of bits in the global public library of tomorrow. Jefferson would be proud.

Copyright unbound

But Jefferson did not understand bits. He could not imagine that 1s and 0s would represent information and one day be read (and eventually understood) by machines. All of copyright law is essentially a Gutenberg artifact, bound to paper and construed in ignorance of the digital age.

It will take us years to build digital libraries and longer to retool copyright law. Intellectual property is an extraordinarily complex subject. We are almost clueless about how to handle digital derivative works and digital fair use. In a digital world, the bits are endlessly copyable, infinitely malleable, and they never go out of print. Millions of people can simultaneously read any digital document – and they can also steal it.

So, how do we protect digital information? Our own export laws (a separate issue you may want to consider) stymie encryption shamelessly. The information age is in a bit of a mess when it comes to understanding who may access what, when, how, and under the control of whom.

But don't wait. You control the library that manages United States copyrights. Establish a Bill of Writes immediately. Force us to find solutions, so our children and grandchildren can benefit sooner, rather than later, from being digital.

A digital deposit act

Here is the idea. Pass a Bill of Writes – a digital deposit act – requiring that each item submitted to the Library of Congress be accompanied by its digital source. Make it illegal to obtain copyright otherwise.

Publishers like Knopf and most authors will be concerned about the protection of their bits. The bill must include a bonded escrow agreement so these bits cannot be released without author and publisher approval. Eventually, the Library of Congress could provide bountiful nourishment for the global infrastructure.

Instead of being the "library of last resort," it might become the first place to look. In a richly woven infrastructure, the Library of Congress could be transformed from a depository into a "retrievatory." It would be closer to your desk and closer to the living-room couch than any of the thousands of public library buildings. A Library of Progress could be in the pockets of tomorrow's kids.

Having a Bill of Writes now means that we can spend the next 20 to 50 years hammering out new digital-property laws and international agreements without stunting our future. More importantly, it means that publishers and authors can elect to make their bits available after they decide they have earned enough, and the bits will be ready to go. Without a Bill of Writes, our grandchildren will spend a lot of time digitizing the 70 million items that will be saved by your library over the next 30 years.

The British and the French are building gigantic new buildings to hold more shelves for future atoms. Let our country be the first to write being digital into law.

Sincerely,

Your friends at the MIT Media Lab

This column was co-authored with Professor Michael Hawley (mike@media.mit.edu), *who holds appointments at MIT in Electrical Engineering and Computer Science, and Media Arts and Sciences.*

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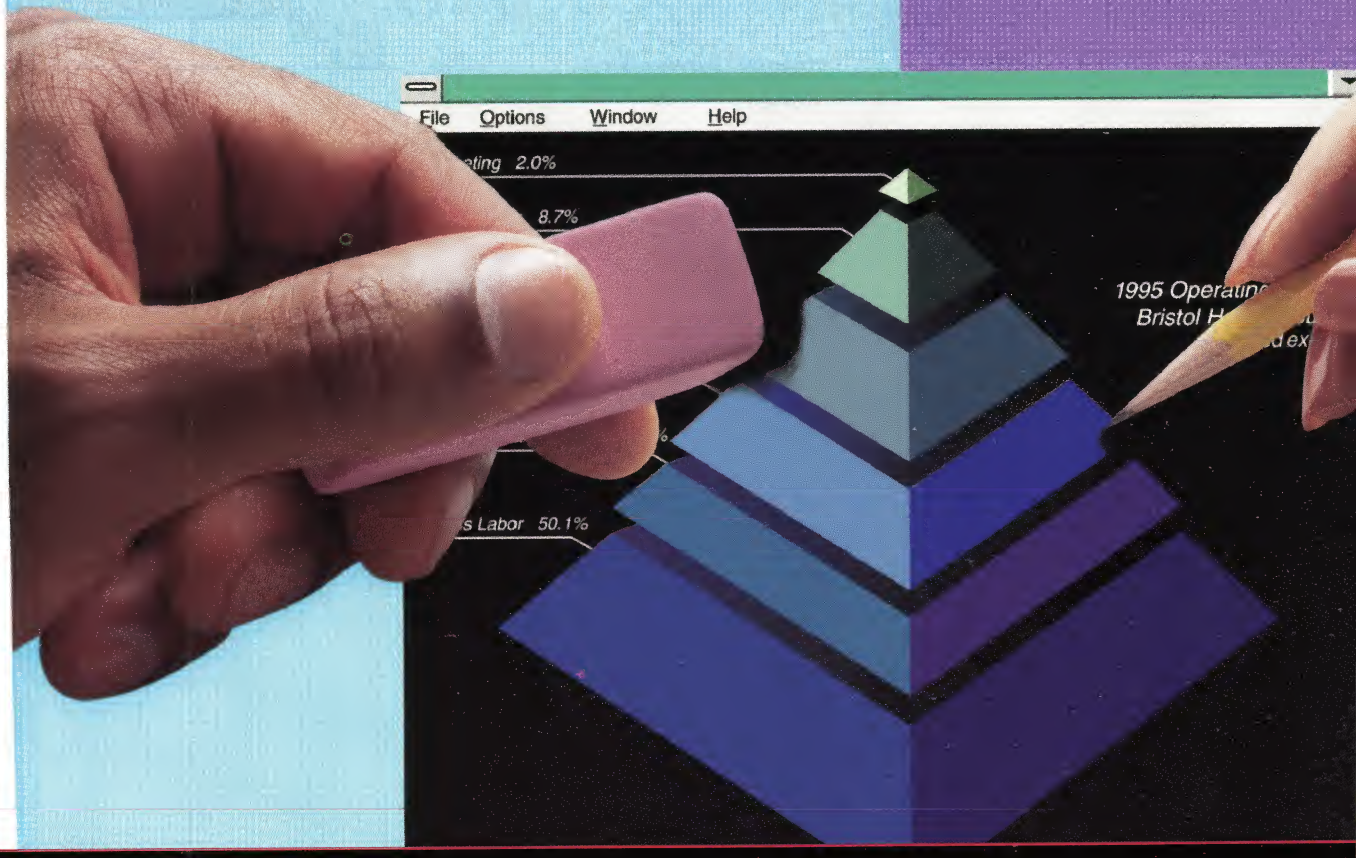

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